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The Society is not responsible, as a body, for the facts and opinions advanced in the papers published by it.

THE OLD ORDER CHANGETH IN MICHIGAN

Conservation was the storm center in the recent political campaign in Michigan. The opposition won and, true to his campaign promises, the new Governor has made a sweeping change in the leadership of the Department of Conservation.

L. J. Young, Professor of Forestry at the University of Michigan, was appointed Director of the Department of Conservation, with wide authority to bring about greater technical efficiency in conservation matters. The Michigan Conservation Department probably embraces as many technical activities as any similar organization in the Union—geology, land economic survey, fire protection, forest planting, state forests, game law enforcement, game, bird, and fish propagation, game refuges, public hunting grounds, and stream pollution. It is, therefore, a job of tremendous responsibilities and of great opportunities for showing what forest leadership, if unhampered by politics and excessive sentimentalism, can accomplish.

It is a source of gratification to the forestry profession that for the first time in the history of Michigan a professional forester was called to the helm of the state conservation movement. An almost wholly new Conservation Commission was appointed, including such conspicuous leaders in conservation as Curwood, Titus, Smits, and others.

The entire country will be watching the work of the reorganized Conservation Department. If it succeeds, and the beginning augurs well for its success, forest leadership in conservation matters will receive further justification. If, for one reason or another, it falls short of the expectations of the people, the result may retard sound progress in conservation.

The staff of the new conservation department, in addition to Young himself, includes a number of high-grade technical foresters whose mettle has been tested in many conservation battles: P. S. Lovejoy,

Marcus Schaaf, and H. J. Andrews. It is up to the profession as a whole to lend at least its moral encouragement to this new leadership and wish it luck.

The old order in Michigan has changed and, we hope that the old order will never come again. Yet the removal from the conservation stage of such a picturesque figure as that of John Baird can not be passed without notice. Whatever his technical shortcomings may have been, he commands the respect of all those foresters who knew him intimately.

Trained in the old school of politics with its unquestioning obedience and loyalty to party, unflinching, and at times not over scrupulous about the methods so long as they served his party and his political leader, John Baird was a firm administrator, the head of his Department, and not without a strict code of ethics and the finer traits of a gentleman and a sportsman.

During the period just past, when political acumen and political maneuvering were essential assets of a conservation leader, John Baird proved an indispensable man in putting conservation on the political map of Michigan. Under his leadership much progress was made in conservation matters in the state and, if foresters can now bring to bear their technical knowledge upon the solution of the technical conservation problems, we must not forget that it was John Baird who paved the way.

We greet with delight and professional pride the advance of foresters to conservation leadership, yet we do not want to be ungrateful to those who went ahead of them and did much of the pioneer work of overcoming political hurdles and political opposition.

With superior technical knowledge, let us hope that the new leaders will also display the same fine human qualities—fearlessness, determination, and the true sportsman's code of morals in fighting for their ideals that John Baird did in fighting for his.

FORESTRY AND THE SOCIETY*

By SAMUEL T. DANA

Retiring President, Society of American Foresters

"So far, as a Society, we have not done much to advance forestry interests. . . ." It is just a decade since this verdict was pronounced by Doctor Fernow in his address as retiring president of the Society. Last year the Executive Council put the case even more bluntly when it stated that the Society "should be the leader in promoting forestry and in advancing the interests of the profession. Unfortunately it is not."

Do comments such as these indicate that there is no important place for the Society of American Foresters in the forestry movement, or merely that it has not yet wakened up to its opportunities? I am confident that there can be but one answer to that question. Foresters are not infallible, but they are peculiarly fitted by training and experience to direct the forestry movement along sound lines. To do so, individual effort, however brilliant, must be supplemented by group. Organization is essential for this, and also to provide the breadth of vision, technical skill, and *esprit de corps* necessary to enable the profession to exercise constructive leadership in making the best use of the forest lands of the country.

Opinions differ as to the progress which forestry in this country has actually made. The optimists see the much already accomplished; the pessimists, the much more still to be done. Most of us, whatever our views as to the past, will agree that a big task still lies ahead. No impressive quotations of statistics from the Capper report or the timber crop report are needed to convince foresters that the forest problem of the country is not yet solved. As little argument should be necessary to convince them that they can contribute more to its solution by pulling together than by pulling apart.

Perhaps one reason why this does not seem to be the case is that, in spite of all the propaganda we have aimed at a more or less indifferent public, many of us fail ourselves to appreciate the true scope of forestry and its consequent importance in the economic and social life of the nation. Each of us, in his own little niche, is so wrapped up in fighting fire, in formulating marking rules, in reducing the cost of

* Delivered at the annual meeting of the Society, Philadelphia, Pa., December 29, 1926.

logging, in improving the manufacture of paper pulp, in selling lumber, and in a thousand other specific jobs, that we fail to see the whole picture. Particularly short-sighted is our appreciation of the influence of the forest on climate, erosion, water, wild life, recreation, and health. Yet it is by no means certain that in the long run forests will not be more highly prized for such social purposes as these than for their economic utility as producers of wealth.

However this may be, we may rest assured that forests, with the myriad uses to which they and their products may be put, will become an increasingly valuable asset. As the population grows, wood-users, water-users, and lovers of nature (and whom does this not include?) will find them more and more essential to their well-being. A hundred years hence, chemistry may completely change the form in which the bulk of the wood is used, but that the demand for forest products and forest influences will be much keener than it is today, who can doubt?

Forestry is becoming increasingly important and complex. The days when a uniform training, with the emphasis on silviculture, mensuration, and management, sufficed to equip all candidates for the profession, are already passed. This is an age of specialists, and forestry, with its innumerable ramifications, is no exception. Today we are finding it necessary to call on practically all of the pure and applied sciences from physics and microbiology to chemical engineering and sociology to aid in solving the problems which confront us at every turn. Forestry is proving to be a good deal bigger and more difficult than most of us have realized.

I stress these points because they seem to me to have a very direct bearing on the function of the Society. The field is so broad that there is an inevitable tendency for individuals and organizations alike to become more or less narrow and provincial in their outlook. Even the Federal Forest Service, with all its influence, is not omniscient, and its leaders would be the last to claim that they are in a position to speak or act for the entire profession. A still more inclusive body, representative of all the varied interests and points of view, is essential for this purpose.

Federal, state and private foresters, teachers, silviculturists, forest entomologists, logging engineers, utilization experts, very often and very properly see things differently. There is danger that in their absorption in bacteria, colloids, tractors, prices, and what not, they will lose sight of the woods and of their common interest. Specialization, desirable and inevitable as it is, tends to narrow our vision and to blind

us to the fact that, whatever minor differences we may have, our ultimate object is the same. We need far more than we did 25 years ago, some means of broadening and unifying our outlook; of developing professional consciousness; and of enabling us to act together effectively in matters of mutual concern.

These things can not be done for us by outsiders. It is up to foresters themselves, through their own Society, to orient, solidify, and advance the profession.

The free presentation and discussion of facts and opinions in the Journal of Forestry, and at meetings of the Society and its Sections, constitutes the first and most obvious step in this direction. Facts must, however, be put to work; ideas and ideals must be translated into action. Constructive activity by the Society in advancing the science and art of forestry, in raising the ethical and technical standards of its members, in rendering individual service to them, and in bringing about the adoption of sound public policies is therefore essential to put forestry in its proper place in the national life and to promote the interests of the profession.

There is, I believe, a growing recognition of these facts. Real progress has been made since Doctor Fernow's verdict of 10 years ago. The report in 1919 of the Committee for the Application of Forestry marked a healthy departure from the previous *laissez faire* policy of the Society. Whatever one may think as to the merits of the recommendations made by that committee, there can be no question that it awakened the Society up as nothing before had ever done. Possibly the awakening was too sudden and violent, and the subsequent relapse into inactivity an inevitable reaction. But for a while the Society really lived. Its discussions were vigorous, at times acrimonious, and they contributed in no small measure to the eventual passage of the Clarke-McNary Act.

During the last few years there have been symptoms of a second awakening, less dramatic than the first, but it is to be hoped more sustained. A definite policy and program have been adopted and a small start made toward carrying them out. Among other things the Society has:

Undertaken, in cooperation with the Forest Service and the American Forestry Association, a comprehensive survey of private forestry.

Opposed the Stanfield Grazing Bill before the Senate Committee on Public Lands.

Supported the National Arboretum Bill before the House Committee on Agriculture.

Endorsed the McNary-Woodruff Bill and an organic act for forest experiment stations and for forest products research.

Called attention to the fact that the need for additional legislation to supplement the Clarke-McNary Act will be largely determined by the attitude of private timberland owners and operators toward maintaining their forest lands in a state of productivity.

Participated in a national conference of conservation organizations to consider ways and means of promoting desirable conservation legislation.

Published, with the generous cooperation of the American Tree Association, a comprehensive and constructive report on "A National Program of Forest Research."

Participated through a large and active delegation in the World Forestry Congress.

This list is more significant as representing a changed attitude on the part of the Society than as a record of actual accomplishment. It is a promise, not a boast. The most encouraging feature of the present situation is that the members generally are doing more real thinking as to the purpose, scope, and possibilities of the Society than ever before in its existence. There is a growing realization of its opportunities for service to the profession and the community, and a growing desire to make the most of them.

The sentiment in favor of a strong Society is not yet, however, backed up by a willingness on the part of the members as a whole to contribute liberally in time, money and effort to its success. We still lack motive power. The much talked-of executive secretary is not a luxury, but a necessity. He would be neither a propagandist nor a lobbyist, but rather a business manager strictly subject at all times to the Executive Council. Although he would undoubtedly represent the Society publicly on certain occasions, his chief job would be to handle its current activities and to enable the sections and committees to function more effectively.

A strong Executive Council, with ample authority to speak and to act for the Society, is another essential of good organization; but in acting on important and controversial matters the Council must be sure that it is really speaking for, and not instead of, the membership as a whole. Its function is to lead, not to dictate. The Society will prosper only as the rank and file of its members participate actively in the shaping and execution of its policies. To leave these entirely to an executive secretary, or even to the Executive Council, would be suicidal.

Individual participation in Society affairs is now possible chiefly through the regional sections and subject matter committees. It would not be surprising if future developments should make it seem wise to expand the latter into divisions, each of which would include those particularly interested in some special phase of forestry, such for example as education, protection, management, utilization, recreation, etc. If so, it will be important with these divisions, as with the sections, to see to it that they do not develop separatist tendencies, but recognize themselves as parts of a larger whole with which their interests are inseparably connected.

The point I wish to emphasize is that the members themselves are the Society. Their responsibilities do not end with paying dues, electing officers, and hiring a secretary. Paradoxical as it may sound, the latter should make more and not less work for the members; and he should organize, correlate, and follow up that work so that it will be far more effective than at present. No doubt the Society as a whole should concentrate its efforts on a few important projects, but this need not preclude section and committee activity in a much wider field. There is enough to be done to keep every one usefully busy, provided only that the work can be properly organized.

That proviso, calling as it does for increased financial support, at once raises in many minds the query, "What do I, personally, get out of the Society?" In answering that question, which is a fair one, due consideration must be given to intangible returns. The Journal of Forestry, indispensable as it is, does not represent all that its members get out of the Society. The broader outlook, the mental and moral stimulus, and the increased professional enthusiasm which come from contact and cooperation with our fellow workers are no less valuable because they can not be reduced to dollars and cents. As the Society gains in strength and prestige, membership in it will constitute recognition of one's standing as a forester that will be worth having; and as it helps to advance the practice of forestry it will provide more and better opportunities for employment.

The recent action of the Society in disapproving of the proposed increase in dues will delay and hamper, but not wholly prevent, the giving of increased service in these directions. The organization is too vital a part of the forestry movement to be allowed to die of starvation. More vigorous support is eventually certain. The immediate need for increased resources is, however, so urgent that I hope the Executive Council will take steps immediately to submit another amendment to

the constitution providing for a smaller increase in dues, and that this will be overwhelmingly adopted. I am convinced that it will prove a good investment. We are taught in forest management that the more one puts into the development of a forest property the more he gets out of it. Why not apply the same principle to our own Society?

In conclusion, let me reiterate my faith in the Society and its future. When its members understand thoroughly its possibilities, there will be no lack of enthusiasm for its support. Forestry grows daily more important and more difficult. Its progress is largely dependent on the vision, skill and leadership of the professional foresters of the country. The Society has an essential part to play in helping us to steer a straight course and in enabling us to do as a body much more than we can do as individuals. No other agency can take its place in unifying the profession, in formulating and maintaining high standards of individual achievement and public service, and in providing opportunity for effective cooperation in our common enterprise. If we believe in forestry, we must believe in the Society. Let us prove it by our works.

THE SOCIETY

By R. Y. STUART
President of the Society

Forestry never looked so big in this country as it does at the beginning of 1927. Define the term as you will, limit the field as you may, there is a man's size opportunity and job for the forester and his profession. The Society will play some part in the forest history of the year. How much?

The urge for more and better forests is growing in the public mind and eye with that for more and better roads, more and better outdoor recreation, and cleaner streams. The basis for it is so sound and the need so great that it can not be stopped. The question for the forester is how he will keep apace with it. Individually he can, and should, give a clear answer. How will the profession answer it?

There are about 1,300 foresters in the Society, each of whom knows and deals with local forest problems and has local public contacts. His fellow foresters in the profession are judged locally by his performances. The acid test of the strength of any organization is the strength of its local constituency. To pass upon a Section of the Society you must size up the effectiveness of its individual members. To throw a dart at the Section or the Society may prove a boomerang.

Thirteen hundred foresters make a small marching regiment but scatter them throughout this country equipped and determined to arouse interest in more and better forests locally and nationally and they will lead the 110,000,000 people to the proper solution of their forest problems. Coordinated leadership, through the Society, can do it.

The Society offers its members the biggest opportunity foresters ever had, singly or collectively, to perform real public service and to place their profession in the commanding position it should hold in all matters pertaining to forestry. One notch of accomplishment can be recorded on a small gun but it takes a big gun to hold 1,300. Will each member of the Society cut his notch in 1927?

The Society needs a bigger gun.

BETTER SEEDS, BETTER TREES*
(With apologies to the "Better Sires" campaign.)

By CARLOS G. BATES
Director Rocky Mountain Forest Experiment Station

Men of wealth do not long hesitate to spend \$25 to \$100 for beautiful yard trees—thousands of dollars in the aggregate for the trees required to ornament a city home or country estate. The same men, in 99 cases out of 100, would not put equal amounts of money into the planting of *thousands* of forest trees, as investments promising returns of four to six per cent.

Why?

Because the forest planting is to be handled as a cold business proposition, and no appeal is made to the investor's aesthetic sense.

Show similar men that there is a way to grow superior trees, to develop forests of exceptional quality and beauty, and both their aesthetic sense and *desire to excel* will be touched.

Perhaps American foresters have made a serious mistake in being too practical; by recommending slip-shod silviculture, the kind of cutting that will yield highest immediate returns, the only kinds of forest practice which are absolutely certain to yield interest on an investment. A corporation may have no "soul," but many private forest owners undoubtedly do have.

The "minimum requirements" on which most forestry activities in the United States are based imply that any forest which has any commercial value whatever, or prospect of attaining such value in the future, is preferable to none. This is probably true, almost inevitably so in the face of the fact that under sufficiently stringent circumstances a use can probably be found for wood in any form, wood of the most worthless species. We readily think of a "synthetic future" in which chemists will mold not only artificial silk and similar high-priced products, but boards, table tops and other solid objects from pure cellulose regardless of source, or at the worst, from any fibrous material obtainable. In the latter group of products, length of fiber will always be important to obtain strength—as is fully attested by the preferred use of spruce fibers in the manufacture of newsprint today—so that here there is a question of quality as well as of quantity.

Still, anticipating all of the possibilities for the synthetic use of the poorer woody materials, is it not true that foresters have a greater ob-

* Awarded honorable mention in the Charles Lathrop Pack Prize Contest.



Where the tree is in perfect accord with its surroundings. These "type specimens" of a strain of mistletoe-resistant yellow pines will not only remain free of a destructive parasite, but also produce clean, straight timber in a very dry situation.



These diseased yellow pines offer no inspiration, nor incentive to forest-growing. Their off-spring promise nothing better, as susceptibility to disease is undoubtedly inherited.

ligation to the public than to encourage the growing of "just trees?" Is it not true of trees, as of pigs, poultry or cattle, as of cabbages or wheat, that the growing of the *best* will in the long run prove the most profitable, even though the initial outlay be the greater? Careful consideration must inevitably lead to affirmative replies to these questions.

Is it likely that any chemical engineer will ever piece together a board or block having the smooth even grain of clear white pine, so priceless to the wood-turner and the shop? Can any painter ever quite imitate the "rays" in oak wood which gives it that matchless grain when quarter-sawed; or the layer of hard "summer-wood" of southern pine or Douglas fir which refuses the stain and hence stands out so beautifully in pine or fir "finish." Yes, it can be done, but only by a real artist, and at artist's prices. And nature does it so easily!

THE SITUATION IN FOREST MANAGEMENT

Of the fact that we are habitually growing inferior trees, many, many illustrations might be given. They are matters of common knowledge, but not matters to which much thought has been given. This is a charge against foresters, a serious charge. Their enthusiasm has carried them away. The field has been too large for them to cover efficiently and intelligently. With more foresters emerging from schools and going into practice every year, it is to be hoped that the matters of which I shall speak may be given more attention. When they are, there will be more satisfied forest-owners. Professional pride demands that foresters give study to these obvious niceties—one might almost say "amenities,"—of the work.

The situation in forest management, that is to say, in the cutting of forests with the expectation of obtaining new stands of trees through natural reproduction, is perhaps not quite so bad as in forest planting. Nevertheless, the great bulk of cutting is not done with any regard for the *quality of the future crop as influenced by the laws of heredity*.

In a very conservative "improvement cutting" the retention of trees only of the best quality is brought definitely to the fore, and insofar as any natural reproduction may result from these (usually light) thinnings of stands, it is likely to be of good quality.

From this point we may have all degrees of disregard for the future crop, until we reach the uncontrolled slashing of the lumberman, who deliberately leaves nothing which at present is of merchantable value. The trees left are not wholly those too small for the saw; they include trees of all sizes containing so great a percentage of defect as

to be unprofitable to remove. And such trees are to be the progenitors of the future forests! Unfortunately they are too often prolific seed-bearers, the forest is reproduced and restocked in satisfactory amount, and practically every tree therein is heir to every imaginable weakness. The laws of heredity do not dictate that every progeny of a diseased tree shall be diseased; they do dictate that the occurrence of disease shall be common among such progeny, since a large proportion of the progeny will be certainly susceptible.

In this discussion we are speaking of the common defects of trees which arise from endemic diseases, the class of parasitic organisms which has preyed upon trees almost as long as trees have existed. Most of these are specific, attacking only one species or a few closely-related species. For most of them it is a fair assumption that the tree species has developed some resistance, else in most cases (the spores or seeds of the parasite being capable of very general distribution) the diseases would be of almost universal occurrence. Some individuals of the tree species may be expected to show complete immunity to one or many of the diseases which beset its fellows, even when growing under conditions which give it every opportunity to become infected.

The converse of the law of built-up resistance to a commonly-occurring disease is found in the case of the introduction of a wholly new disease, such as the white pine blister-rust or the chestnut blight. Without doubt the Cembran pine, to which the blister-rust is indigenous, shows a high degree of immunity to it. The white pines to which this disease has been brought only through artificial modes of transportation, can not be expected to develop resistant or immune individuals at once; several generations of *survival in spite of the disease* may be required. It is said that in the case of our native chestnut no specimens absolutely immune to the blight have been found; there are, however, some showing a considerable degree of resistance, and on these a new race of chestnuts may possibly be built.

In dealing with an epidemic disease, therefore, while the laws of heredity apply and can be made to serve, they do not give us a nucleus of established resistances such as probably exists in the relationship of trees with all of their old, established enemies.

What has been said of tree diseases probably applies, in principle, to their insect enemies. Although evidence of complete immunity to attack is rarely seen, in some way the injury by the commonly-present insects is kept down to a minimum.

THE SITUATION IN FOREST PLANTING

Where the natural regeneration of forests is involved, it goes without saying that the race of trees existing on the ground is reasonably well adapted to the local climatic and soil conditions. If these conditions are extreme, the race or strain may not have had time enough to adapt itself perfectly, but it is unlikely that any other species, race or strain can be found which will be superior to that occurring naturally on the site. Improvement, then, is to be sought only through favoring those individuals which, by every criterion, show the most complete adaptation.

In forest planting, on the other hand, we have not only to consider the relative quality of individuals from which seed is to be taken, but very often, also, the matter of the race or strain which will best fit the conditions of the planting site, since in many cases the seed can not be collected in the immediate vicinity. The American custom of growing stock for planting in large nurseries designed to supply a large territory, is conducive to anything but system and science in this particular, and it is, perhaps, as much on account of this factor as of any other one thing that we Americans face a situation in tree-breeding which deserves the most careful consideration.

Trees must at present be grown in large nurseries because of our universal dependence on machinery rather than on cheap labor. Seeds are obtained for such nurseries by the ton. The seed crop being a failure here, and no surplus seed having been provided, we turn to a distant point for the amount necessary to maintain the productive capacity of the nursery for another year. There could be no better example of the improvidence and lack of wisdom of our system than the existing situation with respect to Norway pine seed. As I write, nurserymen all over the Northeastern and Lake States are offering \$12 per pound, and upward, for Norway pine seed from *any source*. This year Pennsylvania nurseries may be shipping seed from Minnesota; next year Minnesota nurseries will fill their requirements with seed collected in New York. Fine recognition of the fact that Norway pine in Minnesota has adapted itself, through countless generations, to conditions peculiar to Minnesota; that in Pennsylvania to quite different conditions! Indeed, the change from one locality to the other may not be so drastic that the exotic races will not *live*, but who will undertake to say that Minnesota seed will produce *good timber* in Pennsylvania, much less *the best*?

The classical example of unwise and unprofitable forest planting

is found in the use, both here and abroad, of forms of Scotch pine which are almost, if not completely worthless for the production of timber. Yet Scotch pine is *the* timber tree of most of Europe. This outstanding example merely emphasizes the importance of attention to the matter of "climatic adaptation." There are races of Scotch pine suitable for certain climatic conditions; other races suitable for other conditions and decidedly superior under the proper conditions. It is crude, to say the least, not to recognize races and strains of forest trees whose differences often spell the difference between success and failure of forest planting.

From personal observation of innumerable plantations in which the stock used is not adapted to the site, and from study of the extent of variations in our native timber trees similar to those which are so obvious in the widely-planted Scotch pine, I venture the assertion that between 25 per cent and 50 per cent of all forest planting in the United States to date represents wasted effort—in the form either of immediate plantation losses, or of eventual terrific disappointment in the quality of the timber produced—because of the use of poorly adapted species and races of trees. Too often failing plantations are charged to cultural factors, when the fundamental trouble arises from the fact that the strain used is inherently incapable of adapting itself to the conditions.

By their fruits ye shall know them! Neither Moses nor Shakespeare ever spoke a more fundamental truth. An outstanding and undeniable cause of the poor quality which already is exhibited by many forest plantations and which will appear more obviously as time goes on, is the fact that most forest tree seed is taken from the *poorest possible specimens*. Good trees may occasionally creep in as the mothers of our future forests—in nature they do. But it is almost inevitable that where there is the economic urge of "cheap seed," poor, scrubby trees will be the mammas. Who will climb the tall monarch of the forest to pluck its seed? And if resort is had to the hoards of squirrels, is there any better guarantee of quality? Squirrels have an uncanny instinct for selecting the best seed, the fattest seed, the properly-ripened seed, yes. But even these may be taken from a tree which suffers a terrible and dangerous malady, and which is throwing out a fine crop of fruits in its expiring moments. That is one of nature's strange provisions.

Experiments made by Koeser of the Rocky Mountain Forest Experiment Station show that at the tender age of two years, Douglas fir

seedlings only two or three inches high exhibit an inclination to limbiness if the seeds are taken from a markedly short, limby parent tree. And this is the kind of tree which attracts every cone-collector, whether he be professional or merely a wage-earner. In nature, trees of this type are steadily weeded out because of their very inability to reach the light—perhaps not in the first generation, but surely when complete forest conditions are established. Where are we headed if we propagate largely the poorest types for timber-production?

The absurdity of so doing may be seen by a few simple figures. A pound of spruce seed costing \$5 contains 100,000 seeds and probably will produce in the nursery 40,000 trees. In other words, the seed cost of nursery stock is only 12 cents per M trees produced. Cultural costs will run the charges up to \$3 or \$4 per M for seedling stock, easily as high as \$12 per M for spruce transplant stock. The seed cost is, then, only one per cent of the cost of planting-stock. In rare instances it may be five per cent. Who will say that one can not afford to double or even treble this portion of the total cost, to assure a product of really high quality?

CLOSER ATTENTION MUST BE GIVEN TO CLIMATIC AND GEOGRAPHIC
RACES

Whether we recognize the variations within a given species as "botanical varieties," "geographic races" or "climatic strains" is relatively unimportant. The fact is that variations have developed in nature, as results of regional differences in climate, etc., which can not, in safety, and in fairness to the forest investor, be disregarded. These variations go down to the very fundamentals of physiological behavior, and are far more important than the fact that the special strain may still retain the leaf-form or the fruit-form of the "type" stock.

Although long-term experiments whose results will show to the world the practical extent and import of these variations are hardly yet of sufficient age to yield the statistical proof which seems to be demanded by foresters, every investigator who has had personal contact with such experiments, even in their early stages, is convinced of the existence of such varieties within each species, fully as important from every practical standpoint as the differences between species. Enough has already been written of the immature results of such experiments to convince anyone who desires to learn. Why these varietal differences may often be overlooked in the nursery and in the early life of plantations may be seen from the following example:

The western yellow pine is a tree of very wide distribution, growing under a great variety of moisture conditions from the Pacific Coast to the plains east of the Rockies. In Montana, for example, it must be able to withstand the terrific dryness of the winter "chinook"; on the Coast it knows no such atmospheric conditions. The extent and significance of these variations, often leading to a desire to recognize at least two distinct species, have been pointed out by Korstian and others. We believe that a dozen "species" would hardly cover adequately the variations of really practical importance. California yellow pine, for example, is no more at home in Colorado than is redwood or Sitka spruce; Montana yellow pine scarcely more so than western white pine.

At the Priest River Experiment Station in northern Idaho a very interesting plantation of yellow pines was made about 1912, containing representatives of this species from nearly every state in which it occurs. At the end of 10 years the results were anything but convincing as to the existence of important variations. Although each form had some distinguishing characteristic, some of those from distant points were fully as large, vigorous and flourishing as the "home folks."

In the winter of 1924-5 the unusual thing in weather severity occurred—unusual even for northern Idaho, perhaps almost impossible of occurrence except in that general region. It took the form of an extraordinary drop in temperature. Whether it was sudden freezing or the subsequent drying which killed the trees, we care not for purposes of this discussion. But after this occurrence, some of the visitors "were no more," and some were unscathed.

It was not wholly the native forms which escaped damage, but the variations brought out were very striking. From this it will be seen that early survival and a showing of vigor are not final proofs of climatic adaptation. The extreme climatic conditions which a certain strain of trees is peculiarly fitted to resist may occur only at very rare intervals. But when they do occur, they "select" the strong from among the many, in a most decisive manner.

It has been almost universally concluded that the safest practice is to use seed from a point as near as possible to that at which trees are to be planted. There may be exceptions to this rule; it might be preferable to go 200 miles north rather than 100 miles south. But in general the rule is good, "patronize home products." Why do foresters habitually ignore this rule? Largely because it is often "cheaper" to collect seed at a distant point where the crop is especially heavy.

In the planting of exotics, that is, trees which do not normally oc-

cur in the same general region as the planting-site, it will always be difficult to decide from what region seed may best be obtained, except as systematic experiment or the trial-and-error method of experience has indicated the best source. If seeds are obtained from a region with too cold or too dry a climate, they may be unnecessarily slow-growing in their new habitat; if from too mild a climate they may grow too fast, fail to ripen their new wood, and hence show lack of hardiness to the winter conditions. The happy mean must be sought. Arizona yellow pine in Colorado grows more rapidly than Colorado yellow pine but does not winter without injury.

THE DEVELOPMENT OF NEW STRAINS FROM SELECT INDIVIDUALS

When we come to the question of the heritage of individual qualities, very little is known, through direct experimentation, of the properties and possibilities of forest trees, but *much may be inferred* from the systematic investigation of other plants, such as the agricultural crops which can be reproduced in a year's time. Here, remarkable strides of vast economic importance have been made, both through making use of strains suitable for certain difficult climatic and soil conditions, and by the breeding of new ones from outstanding individuals, possessing distinct physiological or morphological characteristics. Because of the time element involved in reproducing forest trees, we *must* take deductions from other lines of work. We can not wait for the final results of our own experiments.

What qualities in forest trees should we especially try to develop or accentuate by selection? In the face of a timber famine, one would, naturally, first think of the quality of rapid growth. Probably something can be done along this line, although the writer is a bit skeptical with regard to its practical effect on the timber supply. The basis for such doubts lies in the fact that wide variations in individual growth of trees in the forest are so common as to lead to the belief that good growth is almost inevitable if the tree has some slight advantage of light, root-space or soil quality, in other words if it has an unusual opportunity to promote its own nourishment. It is often almost impossible to tell whether this opportunity has existed, or whether the tree is, in reality, more vigorous than its fellows.

If, in very rare instances, a rapid-growing tree is found which has had no special advantage, there is the further possibility that its apparent vigor may be merely a faculty for building a somewhat more flimsy woody structure, thereby creating a greater *volume* of wood than

the average tree, but very little more mass. In this event there is no appreciable gain, since the value of wood is more nearly proportionate to its mass than to its volume.

Nevertheless, certain species have obviously evolved as vastly more efficient organisms for cellulose production, than their fellows; there is every reason for thinking that this evolutionary process is proceeding within each species at the present time, and the individuals which are "carrying on" for the further advancement of the species may, by diligent search, be discovered and used. This will result only from innumerable trials and failures.

Much more profitable appear to be efforts toward procuring trees of exceptionally fine *quality* for timber-production, and trees immune to the diseases which attack others of the same species. By a strange coincidence, in one particular case these two qualities are combined, and it is not at all improbable that lack of resistance to various diseases is the cause of many evident imperfections in trees: imperfections which strike the eye immediately if one is considering only such a thing as symmetry; imperfections which go much deeper and lead to great economic losses. Trees, for example, which are afflicted with various forms of heart-rot often indicate it by their exterior appearance; they seldom appear perfectly sound and vigorous, and the expert timberman is able to recognize the presence of the internal defect almost at a glance.

In the Rocky Mountain region one of the mistletoes of the type which infects evergreens only (genus *Razoumofskya*) is an extremely serious pest of western yellow pine. While this parasite works but slowly to cause the death of the affected limb, some trees are so very susceptible and accumulate so many infections that they succumb quickly. In the aggregate much more timber is doubtless being killed by this mistletoe than by the white-pine blister rust, and were the mistletoe attacking a species of high present value, it would be fought with every means available.

The attacks of this parasite are much more common and more virulent on poor soils where the pine is not especially vigorous. Just why this should be, has not been satisfactorily explained. It might be due to the greater abundance of free starch or sugar in open-grown but slowly-growing trees, which foods are used by the parasites. It might be due to the lack of a mineral element in the poor soils, which inhibits the vigor of the parasite when present. Or it could be the result of varying morphological characters, such as thicker bark on the more rapid-growing trees, though the observed facts in the case are rather opposed to this possibility.

Whatever may be the explanation of areas of high infection, the fact remains that in such areas there are individual trees which appear to be absolutely immune to attack, and others so hopelessly weak that no amount of pruning can keep them free of the disease for long. It is the hopelessness of saving susceptible trees, by any practicable means, which makes it necessary to resort to selection and breeding in order to make these disease areas permanently productive.

In a certain area badly infested with mistletoe, trees of an unusual form were discovered. In contrast to the usual sprawling form of young yellow pines where there is no strong incentive toward upright growth, these individuals were noted to be straight as arrows, with small limbs in very regular whorls. A sufficient number of young trees of this type was found in one locality to suggest common parentage, and the mother tree has been, with some degree of probability, located. Other individuals of the same type have been seen scatteringly over a wider area. With one exception, no individual of this typical form has been found to carry mistletoe. The exception was a case in which infection occurred on a new shoot.¹

This form of yellow pine has the appearance of a xerophyte, that is, a plant especially adapted to dry situations. As such it would naturally be more slow-growing than the normal type, and it apparently is. This is not a serious disadvantage, however, as its slender form will doubtless permit it to be planted more closely than are stands of normal trees.

We thus have, in one individual, freedom from mistletoe disease; straight, erect form with small branches, insuring the production of clear and valuable timber; and apparent physiological adaptation to dry situations. These qualities are probably interdependent, if not all of the same exact origin. At any rate this strain illustrates beautifully the desirability of trees suited to their situation and adapted with great precision to a definite set of conditions, among which the liability to disease or injury is as important as the physical factors.

In still another case, where a large amount of planting of yellow pine is being done, it has been found that freedom from an entirely dif-

¹ Without going into details, since the *cause of immunity* has not yet been definitely proven, it may be said that it appears to lie in the lack of succulence of the limbs, whose small size has already been mentioned. Because there is not the usual growth activity in the limbs, the bark of those $\frac{1}{2}$ to 1 inch in diameter,—the size most commonly infected,—seems lifeless and to offer little opportunity for the germination of mistletoe seeds. Of course the new, green shoots do not have this protection, which would explain the exceptional case of infection mentioned above.

ferent disease goes hand in hand with greater general vigor, suitability for the planting site, and probable relative freedom from other pests which retard growth and detract from the value of the timber.

In the light of these examples one might paraphrase the saying "cleanliness is next to godliness" by stating for trees, "in cleanliness is both beauty and strength." The point we have wished to emphasize is that freedom from a specific disease may mean a good deal more to the future forest than just the elimination of disease. It may in many instances denote the most advanced adaptation to the physical conditions of the site.

CONCLUSION

In this discussion there has been no attempt to review the voluminous literature bearing upon the hereditary tendencies evidenced in the plant world; merely by a few illustrations which have come to the writer's notice has he attempted to show some of the ways in which heredity can and does influence tree crops.

It is not necessary for the forester, or the man desiring to grow a superior forest, to go deeply into the details of genetics. It is only necessary for him to give a common-sense recognition to the universal law that "each shall reproduce after its own kind," and to recognize that the "kinds" of trees are not limited to the accepted botanical species.² While it is most important to differentiate the geographic groups which we may call "climatic varieties," still the individual variations are great, and every individual tree is likely to have some good or bad quality which is transmissible to its offspring. To realize the potency of these individual factors we have only to recall the frequency with which trifling peculiarities crop out in the various members of human families.

"Breeding" has greatly increased the returns from agriculture and stock-raising. Can we, dealing with a crop which requires not months but decades for maturing, afford to overlook its genetical origins?

The situation with regard to the planting of poorly adapted varieties and poor stock of forest trees in the United States appears from the writer's observation to be so serious, and to threaten such huge losses of timber values in the aggregate, as to warrant a practical step being taken for its correction. The idea is not a new one, having been given ample trial in agriculture. It is an idea which is, also, international in its scope and will undoubtedly be accepted by European for-

² When the "systematic botanists" have become physiologists and ecologists they may do a service to humanity through the sub-division of these larger groups according to *behavior*.

esters who have suffered from the plague of unfit and inadequate seed supplies. It is the idea of SEED CERTIFICATION for the products of forest trees, the basic material and *sine qua non* of our forest nurseries.

Just how seed certification can be worked out practically, is a matter on which suggestions from many sources are needed. Possibly a federal statute is called for, requiring that all seeds entering into interstate shipments and those offered for import shall be certified as to source. It would probably be adequate to describe the source to the nearest degree of latitude and longitude.

The question of purity of forest tree seeds is not often troublesome, but there should be a central agency prepared to make absolute identification of seeds in all doubtful cases, some of the most bothersome of which will represent specific differences of major importance.

The best seed can not possibly be used if nurseries are constantly being put to it to obtain adequate supplies of the species for which their production plans are laid. The periodic character of seed-production by most of our important forest trees demands that large quantities of seed shall be stored to tide over the intervals when none are produced.

For the benefit of all, much more thorough-going studies are needed, than have yet been made, of the best conditions for seed-storage, with respect both to the physical condition of the seeds, and the kinds of storage which should be provided. Unless such studies indicate conditions very difficult of attainment in small plants, there would appear to be no necessity for a central agency to collect and store seeds for a reserve, but something of the kind may be necessary as an emergency measure, during the period when very rapid expansion of planting programs seems to be the order. Commercial seed-men may be encouraged to make these provisions; the larger forest nurseries could look much farther ahead than they have been in the habit of doing.

Obviously the general situation could be greatly helped if some central bureau, such as the Forest Service, were to act as a clearing-house for forest tree seeds, obtaining a record of all seed-collectors and their outputs, and of all seed-users and their demands. The primary purpose of this would be to allocate available seed supplies in the best possible way, considering not so much the immediate demands as the permanent good of the forests. This bureau should, at the same time, be in a position to study, and systematize knowledge of, the climatic strains of each species which need be recognized, to study the individual seed sources where opportunities are offered for collections of very

special value, and to certify the quality of seeds in these special cases of which a knowledge is obtained. In short, such a seed bureau should be primarily informative, investigative, and helpful both to seed-collectors and users, and should develop administrative functions only when the present chaos has been eliminated.

Every agency of forestry should give study to the matter of particularly desirable locations for seed-collection, and encourage collections therein from trees of desirable quality. Freedom from disease should be a first consideration, but since both this and vigorous growth are often resultants of good site conditions, it is not often possible to designate an entire forest of which it may be said that freedom from disease is the result of established immunity. Rather is it desirable to pick, from average trees on average sites, those individuals which by their relative cleanness and vigor denote the unusual. This guarantees good mother-trees, but still further improvement of special "seed-areas" is possible through the removal of the least desirable individuals of the stand, when they are of such size as to be important producers of pollen. While it is true that pollen is carried great distances, it is equally true that nearby trees are the most important elements in any crosses, so that, from a practical standpoint, only relative segregation of the desirable trees is necessary.

We venture the guess that if a private seed concern of reputable standing were to specialize in forest tree seeds of desirable origin and high quality, it would be overwhelmed with orders, regardless of the increased prices which careful selection would lead to.

The improvement of forest crops through the ordinary processes of cutting and natural regeneration requires no special machinery, though it obviously implies some temporary sacrifices. Pending the outcome of experiments which prove the contrary, it is a fair assumption that every defect in a tree, except such as may be the direct result of mechanical injury,³ represents an heritable weakness, and the trees left in a stand for seed-bearing should be not those which are too imperfect for any present use, but the finest specimens which nature has produced. This is merely the law of common-sense.

³ Even the tendency toward forking which is often the source of wind-breakage, is very probably heritable, though a single fork is often caused by injury to a growing tip. At least, trees which fork repeatedly are to be viewed with suspicion. This illustration will help to emphasize the idea that no tree possessing undesirable qualities can with perfect safety be left as a progenitor.

THE FOREST TRUST

A DEVICE FOR THE ADVANCEMENT OF FORESTRY IN THE UNITED STATES

By P. P. WELLS

If there is to be any worth-while advancement of forestry in the United States it must be made upon forest lands now in private ownership. The facts are tiresome from repetition. A total, excluding Alaska, of 470,000,000 acres that will grow timber or grow nothing,¹ capable, under intensive forest management, of yielding to the axe every year, forever, twenty-seven billion cubic feet of wood to supply a consumption which in 1922 stood at twenty-two and a half billion feet, to say nothing of a further annual burden of two and a half billion imposed by fires, windfalls and large scale ravages of tree-killing diseases and insects.

Here is a potential surplus margin of but two billion cubic feet to match the growth of a population consuming 212 cubic feet per head per year,² a margin which is but nine per cent of the annual consumption; a margin that would be exhausted by less than a single decade of normal growth in population.

But this narrow surplus margin is not a reality. It might exist if every one of the 470,000,000 acres of forest land were under intensive forest management. What does in fact exist is a huge deficit. Three-fourths of the annual drain on our forests is unreplaced depletion of the visible supply.³ That appalling deficit is the result of the mismanagement of forest land in private ownership.

There were in 1922, 80,000,000 acres in the national forests and some 5,000,000 in State forests under scientific management for the continuous production of forest crops,⁴ together making 18 per cent of our total forest area. If we add 6,000,000 acres more under management by the nation and the states chiefly for protection (reservation from timber use) the total under public management rises to 19.3 per cent. Only about 7,000,000 acres of publicly owned forest land (one

¹ Timber: Mine or Crop? (From the Year Book of the U. S. Department of Agriculture, 1922). p. 159.

² Id. p. 108, 109.

³ S. Rept. 28, 68th Cong., 1st sess., p. 13.

⁴ Timber: Mine or Crop? p. 167. From the total of 7,000,000 acres in State forests must be subtracted the 2,000,000 acres of the New York State Forest Preserve (World Almanac 1926, p. 473) in which the harvesting of timber crops is prohibited by the State Constitution. The area of the national forests and national parks as of January, 1924, is put at 77,600,000 acres by Sen. Rept. No. 28, 68th Cong., 1st sess., p. 19.)

and one-half per cent of the total forest area) is not under protection or management. In the matter of timber growing public ownership has done well.⁵

Nearly all the disastrous annual deficit (depletion) accrues on the 371,000,000 acres of forest land (79 per cent of the total) that are private property. Here, then, is the forest problem of the United States. Reduced to its lowest terms it is: How shall forest devastation on private lands be stopped? Thus far three remedies have been proposed. The first is the substitution (by purchase) of public ownership for private ownership.

State purchases of private lands for the continuous production of timber crops began about thirty years ago,⁶ and in 1922 had reached a total of 5,200,000 acres.⁷

Federal purchases under the Act of March 1, 1911, had, by 1924, amounted to over 2,000,000 acres,⁸ a total of about 7,200,000 acres since the policy of public acquisition was begun. In 11 years ending in January, 1924, all forms of public forest ownership made a gain of about 10,000,000 acres.⁹

At this rate it would take 400 years to solve the problem by the acquisition of all forest lands now privately owned. Pennsylvania's acquisition program of about 5,000,000 acres, some 40 per cent of the total forest area of the state,¹⁰ is impressive evidence that the rate will be accelerated. But "it is not conceivable that either State or Federal budgets could support the expenditures needed to buy enough forest land to bridge an appreciable part of the gap between timber growth and timber use short of an unendurable lapse of time. The dependence of the country upon timber production on privately owned lands is unescapable."¹¹

The second proposed remedy is governmental regulation (federal or state) of timber growing, and especially timber harvesting, on private lands. Some tottering steps toward regulation by the states have been taken here and there. But the lumber interests are strongly entrenched in political power in the producing states. To expect those states to

⁵ These figures are from *Timber: Mine or Crop?* pp. 159, 167.

⁶ Pennsylvania made its first purchase in 1898, Connecticut in 1903. New York's policy of reservation from timber use makes its beginning in 1885 irrelevant here.

⁷ Omitting New York.

⁸ Sen. Rept. No. 28, 68th Cong., 1st sess., p. 19.

⁹ Ibid.

¹⁰ It has been approved by two legislatures and awaits submission to the people in 1928.

¹¹ *Timber: Mine or Crop?* p. 173.

exercise any considerable degree of compulsion upon their masters is a Utopian dream. Even if thorough state regulation were politically feasible it is commercially impracticable. The lumber business is nationwide. The producing states are competitors for the profits to be derived from the business. No one of them will impose severe restrictions lest its rivals take from it the cream of the business and of the profits. The federal government alone can impose a uniform, and therefore a fair, system of regulation. Only the people of the consuming states, acting through the federal government, can break down the political power of the lumbermen to prevent effective regulation through the governments of the producing states. If regulation is the remedy it must be federal regulation.

Accordingly, federal regulation was proposed by the Pinchot Committee of the Society of American Foresters some years ago and embodied in the "Capper Bill."¹²

This measure would impose a federal occupation tax of \$5 per thousand board feet on the business of logging and pay a countervailing bounty of \$4.95 per thousand in respect of forest products yielded by logging done in accordance with regulations prescribed by the Forest Service. The differential five cents per thousand board feet was estimated to yield \$2,000,000 per year to cover the expense of administration.¹³

It is not unfair to say that this proposal has received no serious consideration outside the ranks of the professional foresters; within the profession, though supported by an earnest and militant minority, it has failed to win general approval. It is unanimously and vigorously opposed by the lumber and paper interests. If its enactment ever comes within the range of the possible it will be bitterly fought in Congress and will be obstructed and delayed by every time consuming device of parliamentary maneuver and constitutional argument. If enacted its validity will be bitterly contested through all the courts. Moreover, the present current against governmental regulation of business in general and the further widening of federal authority in particular runs too strongly to leave any hope of standing ground for this measure in the near future. Without discussion of its supported merits on social, constitutional or silvicultural grounds we may for the present dismiss it as unavailable because of this time element. We are therefore thrown

¹² For the text of the bill and a brief contending for its constitutionality see: Hearings before a select committee on reforestation, U. S. Senate, 67th Cong., 4th Session, pp. 1283 ff.

¹³ *Id.* p. 1296.

back upon uncontrolled private forest ownership as a condition inherent, for the present at least, in our problem. Therefore we must get out of it all that can be had before we turn either to wholesale public ownership or universal public regulation.

Accordingly the third remedy that has been proposed is moral suasion, enlightenment and material aid proceeding from the government (chiefly the federal government) to the private owner of forest land or maker of forest products. The moral obligations of his stewardship of an indispensable natural resource are to be brought home to him. He is to be instructed how best it can be managed for the public welfare in this and succeeding generations without too great present loss to himself in foregone immediate returns. He is to be given protection against the fire risk at public expense. His taxes are to be lessened and to be postponed until his logging shall give him funds wherewith to pay them. Under this treatment he is expected to become virtuous, socially minded, wise, secure, prosperous and content (not to say that he is poverty-stricken or not content today). The picture of the patient as he should appear "after taking" is engaging. But is the diagnosis correct?

Why is it that private owners of forest lands do not set themselves to grow timber crops? Is it indeed fire, or taxes, or stupid ignorance, or unsocial greed beyond measure? It is none of these. Given owners earnestly set upon and generally practicing the growing of timber crops and the tax and fire problems would find quick solution. Fire and taxes are the symptoms, not the germ, of the disease. Nor do lumbermen and paper makers in point of stupidity or greed fail to be of one blood with the other children of men. What then is the cause of their almost universal failure?

It is simply this: A human life is too short for the growing of timber crops. The thirty-five years between the ages of twenty-five and sixty are not enough. During 60, 80, 100, or 120 years, or more, a continuing and steadfast purpose must direct the enterprise. A nation, a state, a city, in some degree a European baronial family, can supply it. An individual can not, nor can an ordinary commercial corporation so constituted as to leave to those who may be the beneficial owners at any time the option of abandonment. That is why forestry, the growing of a continuous succession of timber crops, has everywhere and always succeeded better under public than under private ownership. If this is the disease is there a remedy consonant with private ownership and what can government do to aid in its application?

There is a remedy at hand, long used, well known, applied for centuries past to property ailments of many sorts but never yet to forest devastation. It is the legal device known as the "trust." By it property is placed in the hands of one or more trustees and their successors in that duty to be managed in the manner and for the purposes fixed by the original owner in the writing creating the trust. The trustees are bound to pay the net income to, and upon the winding up of the trust to divide the principal among the beneficiaries designated by the declaration of trust. For this, and for the management of the property in the manner and for the purposes fixed in the declaration, the trustees are strictly accountable to the courts. Otherwise they are the absolute owners and masters of the property. Their manner and purposes of management can not change, being fixed by the declaration. Death is powerless against them because successors are raised up by the terms of the declaration or by the courts. This legal device has come down to us from the Middle Ages. The general principles of its being are familiar to every lawyer. It has been used for centuries in family settlements of property and in gifts to charity. Its misuse in the United States during a few brief years for unsocial commercial ends has made it permanently synonymous with the word "monopoly." But it has been lawfully and helpfully applied in America, especially in Massachusetts, to the conduct of business, especially in urban real estate, in place of the business corporation.

The law of the "Massachusetts business trust" (the device is now used in many other states) has grown healthfully from the roots of the common law through business practice and judicial decisions without legislative interference. Unlike the corporation it is not the creature of the state and the guaranties vouchsafed to "citizens" by the Constitution of the United States are available to it.¹⁴

The beneficiaries have no rights beyond that of due participation in the income and in the ultimate division of the principal plus the right of forcing the trustees, through the courts, to manage the business in the manner and for the purposes specified. They are not the owners of the property and are not liable for the debts properly incurred by the trustees in the management of it.¹⁵

By due wording of the declaration the interest and rights of beneficiaries may pass from hand to hand as transferable shares like those of a corporation.¹⁶

¹⁴ *Farmers Land, etc., Co. vs. Chicago, etc., Ry. Co.*, 27 Fed. 146; *Shirk vs. Lafayette*, 52 Fed. 855.

¹⁵ *Johnson vs. Lewis*, 6 Fed. 27; *Mayo vs. Moritz*, 151 Mass. 481.

¹⁶ *Crocker vs. Malley*, 249 U. S. 223; *Dana vs. Treasurer*, 227 Mass. 562.

The trustee is the owner of the property. He is a principal, not the agent of the beneficiaries, and his powers and duties are commensurate with that status.¹⁷

Nevertheless by due wording of the declaration and of his contracts he may be free of personal liability for debts contracted by him in the conduct of the business and creditors thus warned and required to look solely to the trust property for payment.¹⁸

The business trust, which we will now call the "forest trust," is a fit legal instrument for the management of land to produce forest crops. As to forest land already productive the motive of personal gain through permanent investment is sufficient for the creation of a forest trust. In the care of land denuded or recently cut over the case is different. Here no profit can be expected for a considerable period of time. The enterpriser must be content to wait through years for income. This the state can profitably do.¹⁹

The ordinary landowner may be unwilling to do it on the sole basis of immediate self-interest in cases where a timber crop can not be expected for many years. Perhaps the altruistic motive might be successfully appealed to in such a case. If generous donors spend many millions of dollars upon a single college building or group of buildings, for a memorial, may not others, large and small, be found ready to defer profit for the time necessary in the circumstances of the case? What memorial could be more immortal than a forest managed for a sustained yield? For example, the Connecticut Forestry Association has built up and turned over to the state "The People's Forest," bought with the proceeds of large and small contributions made on the basis of a purchase price of eight dollars per acre. If the contributors had placed their money in a forest trust, taken transferable beneficiary shares of the par value of eight dollars each, and been willing to bear the expense of administration, etc., until the first crop, they would have combined ultimate private gain with present free public service.

The forest trust might be made a useful instrument for the co-operative management of a number of farm wood lots which by reason of their size could not each bear the expense of proper planning and

¹⁷ Taylor vs. Davis, 110 U. S. 330.

¹⁸ Taylor vs. Davis, 110 U. S. 330; Bank of Topeka vs. Eaton, 107 Fed. 1003.

¹⁹ A tract of cut-over land, purchased for a Connecticut State Forest in 1903 at \$1.50 per acre, was thinned in 1923, yielding 85½ cents per acre per year to the year of cutting, after deducting town taxes—interest and the cost of administration not computed. Two-thirds of the stand, superior in quality, was left for later harvesting as saw-timber. In this case it paid the state to wait 20 years for its first installment of income.

supervision, and on account of their number could not otherwise be subjected to unchanging ownership animated by the steadfast purpose of timber production. In such a case appropriate wording in the declaration of trust could make appurtenant to a particular farm, the shares representing the original wood lot of that farm and could apportion to the holder of such shares the net profits and all other benefits arising from the management of that particular woodlot.

The forest trust would contribute to the solution of the fire problem and the tax problem. By continuity of purpose and management fire hazards would be reduced and fire fighting systematized. There would often result the substitution of a single unit control over a large area for control by many persons over many separate tracts, in other words permanent cooperation for the prevention and suppression of fires.

The tax problem also would be clarified, perhaps simplified. Since the declaration of trust would compel management for a sustained yield the true nature of forest property and forest income would be made clear. Since the beneficiaries could not deal with the property at all and the trustees could not sell it, while the trust endured, nor manage it otherwise than for a sustained yield, its permanent value would be seen to be a function of the sustained yield and not of the timber standing on the land at any moment. The underlying fallacy of present methods of forest taxation could not easily survive the exposure. Moreover, the trustees could take advantage of existing yield tax laws, such as that of Pennsylvania.

The essentials for the success of a forest trust are competent trustees, a proper definition of their duties and powers in the declaration of trust, and duration sufficient for the growing of a forest crop. Therefore, some or all of the trustees might well be foresters designated *ex officio* as holders of certain official, research, or education places, as, for example, the State Forester; the forester of the State Agricultural Experiment Station; the professor of forestry in the State Agricultural College; the dean of a certain forest school, and the like.

In variance from the usual powers of business trustees, the land holdings of forest trustees should be limited to land examined under their authority and found by them to be chiefly valuable for the growth of a continuous succession of forest crops. There should be provision for re-examination from time to time, for the sale of tracts found to be chiefly valuable for other uses, and for the reinvestment of the proceeds in other forest lands. They should be directed to manage

the trust lands as they deem necessary for a sustained yield and to that end to sell dead, down, diseased, insect infested, inferior and mature timber; to regulate in the interest of the beneficiaries all other subsidiary and incidental uses, to the end that the trust property, and every part thereof, should be put to its highest and most complete use.

In order to secure the transferability of beneficiary shares without the formalities required for deeds of land, business trustees for the management of real estate are usually directed by the declaration of trust to convert the real estate into cash. This direction operates to give it and the shares representing it the character of personal property in point of transferability. The trustees are then authorized in their discretion to postpone such conversion until the time fixed for the winding up of the trust. Since the purpose of the forest trust is the holding and management of the same land throughout the trust period, it would be helpful but not indispensable to have legislation declaring the shares of forest trusts personal property.

To insure permanence it would ultimately, but not at the outset, be necessary to obtain state legislation exempting forest trusts as to lands held by them and from time to time found by the state forester to be chiefly valuable for the growth of a continuous succession of forest crops, from the time limit imposed by law on business trusts. This limit (the rule against perpetuities) is the life of certain persons described in the declaration of trust (usually the first trustees and their children living when the trust is created) plus twenty-one years thereafter. Gifts for charitable uses are exempted from this time limit and the exemption is from time to time enlarged by statute as the public interest seems to require. For example, the Supreme Court of Connecticut ruled that the care of graves was not a charitable use and that a gift in perpetuity, the income to be used for that purpose, was void. Thereupon the Legislature passed an act exempting gifts for the care of graves from the rule against perpetuities. In view of the vital public interest in the management of private forest lands for a sustained annual yield, such legislation, properly safeguarded as above suggested, ought not to be difficult to obtain well before the expiration of the initial trust period, which might be so set up as to run, say, 75 years. The absence of it in the meantime would be no obstacle to the formation and conduct of forest trusts.²⁰

²⁰ For a brief discussion of the history and law of business trusts see: *Business trusts as substitutes for business corporations*, by Guy A. Thompson, St. Louis, Thomas Law Book Co., 1920.

IMPROVEMENT CUTTINGS—THEIR ROLE IN AMERICAN FORESTRY

By M. H. MOYER

Is the primary, ultimate, and fundamental aim and purpose of forestry in America to perpetuate growing forests and forestall a seriously precarious timber situation?

Has forestry not been instituted for this purpose, and for this reason, only, been condoned by the citizenry, supported by the legislative, and proclaimed by the governing?

Forestry, the institution bore forestry, the profession, and, as such, is recognized—supported, considered, and granted.

Several decades have gone by. To judge the situation as it stands today, let us witness:

Journal of Forestry, April, 1926, first page editorial.—“If words would make trees grow, the United States would be the most thickly wooded country in the world . . .

“In spite of all this talk, our old forests are disappearing just as fast as before and even the second growth is being cut into at a rapidly increasing rate. The fire situation shows only slight improvement and the acreage of idle land is increasing.

“Why such divergence between words and action? . . .

“. . . we are off either in our economics or—psychology.”

Journal of Forestry, May and June, 1925, A Message—American Engineering Council, Washington, D. C.—“I consider it [reforestation] the most vital factor in the future welfare of the country. Looking into the future no farther than 75 or 100 years, I can see conditions arising, if our cut-over lands remain barren, which will make it very difficult if not impossible to live in this north temperate zone of ours—certainly not in the way we are now living . . .” “. . . the greatest and most vital problem of our age: the restoration of our forests.”

Is this not high evidence? Is it not representative opinion? Is it not our thought and belief?

So serious! What is our country going to do about it?

Does America not care what happens? Or does it not know what to do?

Let us reflect:

In the beginning the U. S. Government was urged to withdraw some of the virgin timber land as Forest Reserve. It was done. Later

the U. S. Government was told that much of this reserve timber was mature and should be put on the market. This, too, was done.

Forestry urged the timberland owner, public and private, to quit "destructive" lumbering and to practice forestry—to cut fewer trees and cut them near the ground, and to reforest by planting. This sounded good to America in general. To the operating timberland owner, large and small, this sounded false and foolish.

America may assume that this is being done, and that nothing else can be done for the salvation of our forests. In picture and print it has been told and retold the story of accomplishment: A thousand trees planted here—millions set out there—available timber supply extended by use of less wasteful logging methods—billions of feet of timber saved by war on insects and fungi—threatening forest fires being fought—and so on.

America has said yes and amen to all that has been pleaded for forestry. It has preached it, sung it, and prayed it. It believes it has financed it—millions for reforestation, millions for research, millions for protection—all in faith and hope, not in comprehension.

It little realizes that what it believes is being done, the artificial reforestation of cut-over lands, has fortunately not begun—the thousands and millions of trees planted, which is its main criterion of progress in forestry, have but touched up a few corners—mere experiments, ornaments and demonstrations. The millions of acres are: *as they were* or worse.

The timberland operator has a clearer comprehension of the situation. His eyes show a contempt with pity for the accusation that he has wantonly denuded his lands. Mockingly he smiles when told to reforest his lands by planting. He does not take lightly the statement that "the acreage of idle land is increasing." He knows it. But, also, he knows that timber cutting is not the cause of it, and that tree planting is not the remedy. He knows there is but one major cause: forest fire, and that controlling this is the only remedy. As long as he can not do this or can not afford to do it, that long he can not afford to sink in more money and energy to go up in smoke with the rest.

What will forestry do? Will it start at the bottom and build the way up, or will it develop the top and crash down with it when the bottom is burned out?

Whether forestry is the cause of it or the result of it, will it continue to allow the country to labor under the impression that there is timber salvation in artificial reforestation and other forest technique in

this country of ours where fires destroy each year, no one knows how many times over, areas of better natural regeneration and on much more productive soil than is available or feasible to plant?

Will it not convince and convert itself that the acreage of idle land is increasing in this very decade, even where "forestry" is in vogue—that it is *idle* only because of fires, that it is *increasing* because many more acres are burned than are reforested—to say nothing of the relative value of acre for acre of natural vs. planted stands?

We have talked and practiced fire prevention. We have reduced the number of fires starting and we have fought those started. Still "the fire situation shows but slight improvement." Those in the forest regions, and with eyes to see, need not statistics or graphs to verify this.

This is so because the great portion of the total acreage burned comes from a very small percentage of all fires started.

Since man's past record with fire—either here or abroad, in the forest or out of it—gives us no grounds to say that fires are not accidents, and gives us no reason to hope that we can prevent them, and since after valiant endeavors we have found that they can not be successfully combatted, it behooves us to resort to the one known, tried, and proved way of subjugating fire in the woods.

Where the location and physical conditions of the forests are such that man can halt the progress of a fire at will, nothing need be said here.

Where the forest conditions are such that fires sweep on against man's will, regardless of owner's effort, cooperative effort, governmental effort—regardless of organized forces and vainly lauded equipment of tools, tanks, and engines, our attention is pertinent.

This is where our heritage is lost, where our potential forest land of optimum productivity is turned into idle land—fit to plant trees on, but not fit for them to grow on.

Every season in every forest region we see—both in the East and in the West, both on a large and on a small scale—forest fires raging past man's defense until snuffed out on some barrier. The barrier may be the border of the forest or the forest itself in a less inflammable state. It may be natural or man-made, incidental or intentional.

This *barrier*, this absence of sufficient inflammable material is the only means of controlling forest fires in evidence anywhere.

It is the main explanation for the unscorched woodlots of America. It is the means employed by forestry in Europe where it is used not only to fireproof individual stands, but it is used to cut off or separate •tands of young thickets.

The forest stand that has the bulk of the *débris* and brush removed from the forest floor among the trees is verily *fireproof*. Who has not mental pictures of such forest stands? Many an American woodlot and many European forests are thus immune from fire.

Any forest region in any country that has large contiguous areas of thickets or inflammable forest stands has also large areas of fire-devastated land, and any region that has good forests has them because protected by some such barriers.

This is no new discovery. Forestry early saw this, but also saw that under the circumstances—social, industrial, and economic—America would have to start with an adapted system of defense lines against fire. The result was our fire-line systems. They held out the main and great hope; and, where circumstances are not too adverse, they fulfill it all. They are in no wise to be depreciated. They represent not time and energy misplaced. Rather they are the skeleton work to be modified and re-enforced into a barrier system of fireproof strips of sufficient width to halt the progress of fire.

Fireproof strips means not bare-soil strips that fires can not creep across. It means not wider clear-cut strips which promptly revert to thickets and have to be rebrushed. It means: *removing and disposing of the rubbish that feeds the flames and baffles the fire fighter; and leaving enough trees, where available, to form a canopy to shade the ground.*

It means improvement cuttings—thinnings and cleanings, which in Europe may pay for themselves but in America must be paid for.

If America—the individual, the community, the state, the nation—be not able to pay for this, then self-evidently it, respectively, is not able to pay for reforestation by planting.

In benediction, we hear the words of Dr. Fisher of Harvard, only a fortnight ago, to the New England foresters: "For half the cost per acre of planting, tens of thousands of acres of our cut-over wild lands can be bought and converted by improvement cuttings into more valuable timber crops than the average plantation will ever produce."

THE LINE-PLOT SYSTEM, ITS USE AND APPLICATION

By W. M. ROBERTSON

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There is need for a method of investigating the potential values of large forest lands which will combine the essential features of the regeneration survey system with those of permanent sample plots, a flexible, rapid method making provision for periodic re-examination.

Regeneration surveys based on the strip system have been made of mixed wood cut-over lands, and these have supplied graphic pictures of the present condition of the stands and the transformation effected by the cuttings.

Large permanent sample plots have been established on areas selected as representative of extensive tracts, by means of which the future possibilities of these pulpwood lands might be foretold. It seems apparent now, however, that the comparatively few large sample plots that are economically feasible will not be representative of more than very small local areas since in this mixed wood type so many factors as species, site, topography, degrees of cutting, must be considered. In consequence, therefore, it is conceivable that a large number of small plots evenly distributed throughout the area will yield more accurate information of the entire area than will a few large plots "hand-picked."

On this assumption, then, the Research Division of the Dominion Forest Service developed and applied the line-plot system in conducting these and similar scientific investigations.

The line-plot system is simple, rapid, accurate, and has the added advantage that it lends itself readily to analysis by statistical methods. Where samples are of uniform size, as in this system, it is possible to examine the data periodically and thus determine what degree of accuracy the estimate will yield, and whether the frequency of the sample should be increased or decreased.

In application, blazed lines are run perpendicular to the base line at regular intervals. Along each perpendicular line small permanent sample plots of one or two square chains each are also regularly spaced. The interval must be sufficiently short to ensure enough plots to provide an average sample of all conditions. On the other hand, in the interests of economy it should be as large as the desired accuracy will permit.

The application of statistical methods is perhaps not essential but is, undoubtedly, very valuable. An analysis of the field data from time to time ensures the taking of sufficient but no unnecessary plots to produce an accuracy within required limits for any given factor. It makes possible an examination of the relative value of each of the various factors under investigation, since a separate analysis of each may be made. Having established 50 or more plots, an examination of the data by means of a dispersion table will indicate whether the interval selected requires re-adjustment. Since the plots are numerous and small, many of the details required for the standard permanent sample plots may be omitted. Trees need not be tagged; maps are not required; the same refinement of measurements is not essential; the work of compilation is materially reduced; and in consequence the line-plot system is more simple and rapid, with a consistent degree of accuracy.

An examination of this nature has been started on certain spruce-balsam, birch-maple lands in Quebec from which the merchantable conifers had been removed. Since the hardwoods are not at present accessible to market, it becomes a question to determine what the prospects are for a future cut of conifers. While there are subsidiary problems calling for all the details of standard permanent sample plots, a solution of the above question is the purpose of this line-plot examination.

Since the area as a whole, with the exception of the pure hardwood type (birch-beech-maple ridges), is being examined, it is considered as a single type, mixed-wood, notwithstanding that, due to logging, certain sections have been converted to hardwood type, type being determined on the basis of the main stand. Nevertheless, there is in general a goodly representation of conifers in the understory. Except for occasional black spruce swamps, pure conifer types do not occur. With an initial area of ten square miles to cover, it was decided to commence the investigation with plots two-square chains each, spaced at ten chain intervals. On this basis 100 plots were recorded which were subjected to a statistical analysis to determine:

1. The accuracy these would furnish for the area covered.
2. How many more plots would be required to furnish an accuracy of $\pm 5\%$.

Basing the analysis on the total square feet basal area of the main stand on each plot, the following dispersion table was prepared:

*Dispersion Table of Basal Areas for 100 Plots in Mixed-Wood Type—10-Chain Intervals
Lake Edward, Quebec*

Column No.						
1	2	3	4	5	6	7
Basal area sq. ft.	Frequency n	Minus deviation from origin d—	d—(n)	Plus deviation from origin d+	d+(n)	d ² (n)
4	1	10	10	..	..	100
5	2	9	18	..	..	162
6	4	8	32	..	..	256
7	4	7	28	..	..	196
8	7	6	42	..	..	252
9	6	5	30	..	..	150
10	7	4	28	..	..	112
11	12	3	36	..	..	108
12	3	2	6	..	..	12
13	3	1	3	..	..	3
X14	6	..	..	..	..	...
15	3	..	..	1	3	3
16	8	..	..	2	16	32
17	4	..	..	3	12	36
18	8	..	..	4	32	128
19	7	..	..	5	35	175
20	5	..	..	6	30	180
21	0	..	..	..	..	...
22	3	..	..	8	24	192
23	2	..	..	9	18	162
24	1	..	..	10	10	100
25	..	..	..	..	..	...
26	1	..	..	12	12	144
27	..	..	..	..	..	...
28	1	..	..	14	14	196
29	..	..	..	..	..	...
30	1	..	..	16	16	256
32	1	..	..	18	18	324
	100		233		240	3279

(X) Arbitrary origin symbol 0=14.

The following brief explanation of a dispersion table is given in an attempt to demonstrate that it is in reality not complicated or difficult, and to illustrate to some extent its extreme value. It is merely a tabular statement showing in:

Column 1—the basic data of a number of samples listed, for convenience, in either ascending or descending order of magnitude. In the example, basal area of the main stand in square feet was used.
Column 2—the “frequency,” symbol n, of occurrence of samples of the respective magnitude.

Column 3—assuming an arbitrary mean sample or “origin,” symbol 0, in the basic data the difference or deviation of the other samples less than this origin listed as “deviation” minus, symbol d—. In the example 14 square feet was chosen as the origin which, from a cursory examination, seemed to be about the average sample.

Column 4—the product of columns 2 and 3, symbol (d—)n.

Column 5—the “deviations” greater than the origin, symbol d+.

Column 6—the product of columns 2 and 5, symbol (d+)n.

Column 7—the “deviations (columns 3 and 5) squared, multiplied by the respective frequency.” (Column 2), symbol d²n.

Columns 2, 4, 6 and 7 must be totalled, which completes the dispersion table proper.

The following deductions are next required:

- (1) “Standard deviation,” symbol s.

(W. G. Wright, Bull. 77, Dominion Forestry Branch.)

The standard deviation is the square root of the mean of all the deviations, that is—

$$\pm \sqrt{\frac{\text{Column 7}}{\text{Column 2}}} \text{ formula } s = \pm \sqrt{\frac{d^2n}{n}};$$

$$\text{in the example } s = \pm \sqrt{\frac{3279}{100}} = 5.8$$

- (2) “Mean” symbol m,

(Wright—Section 9)

The true “origin” or “mean” is the arbitrary origin plus the algebraic sum of the deviations, columns 4 and 6, divided by the “frequency,” column 2—

$$= 0 + \frac{[(d-)n + (d+)n]}{n};$$

or substituting,

$$14 + \frac{[(-233 + 240)]}{100} = 14.07$$

- (3) “Maximum error,” symbol e,

(Wright—Section 22)

The “maximum error” is the arbitrary limits of variation from the mean permissible in the results. Here it was desired to obtain a result accurate within $\pm 5\%$, hence $e = \pm 5\%$ of 14.07 square feet = ± 0.7 square feet.

- (4) "Standard error," symbol S
(Wright—Section 22)

To limit the chances of an error to 1 in 22 the "standard error," S , must not exceed one-half the maximum error, that is $\frac{0.7}{2} = 0.35$.

- (5) Number of plots required is derived from the formula

$$n = \left\{ \frac{s}{S} \right\}^2$$

Where n = number of plots
 s = standard deviation
 S = standard error

$$\text{hence } n = \left\{ \frac{5.8}{0.35} \right\}^2 = 276 \text{ plots}$$

That is to say, providing no greater variations, proportionately, occur in the basal areas of the remaining samples than were found in the first 100 plots, the chances are twenty-two to one that the stand table averaged from 276 plots regularly distributed throughout the area, will not vary from the average of the entire area by more than $\pm 5\%$.

- (6) Conversely, the degree of accuracy resulting from the samples already taken may be shown as follows:

$$\text{The standard error, } S, = \frac{s}{\sqrt{n}} = \frac{5.8}{\sqrt{100}} = 0.58$$

$$\text{The maximum error, } e, = 2S = 1.16$$

$$\text{The resultant percentage} = \frac{e}{m} \times \frac{100}{1} = \frac{1.16 \times 100}{14} = 8.3\%$$

Hence the chances are 22 to 1 that a stand table prepared from these 100 plots will be representative of the area examined within the limit of $\pm 8.3\%$.

On the basis of this analysis the interval between plots and strips was extended to twenty chains. After 200 plots had been taken, a second analysis disclosed the fact that 193 plots were all that were required. But as the 200 plots had not covered the entire area, the survey was completed using 20 chain intervals.

Then it would seem that in general at least 100 plots should be established, and where there is much variation in the conditions, this number may have to be materially increased. The following are suggested as preliminary intervals:

For areas up to 3 square miles.....10 chains each way
From 3 to 10 square miles.....20 chains each way
Over 10 square miles.....40 chains each way

By similar use of dispersion tables other factors as individual species, seedlings, rate of growth, mortality will be examined, thus furnishing a statement of the dependence that may be placed on the information supplied for each.

The possibilities of single examination line-plots as a means of timber estimating on large areas deserve consideration. The comparatively small area of actual cruise required by plots in comparison with that required by the strip or other cruising methods make it economically feasible to devote more care to measurement of area and stand, a consideration too often not sufficiently emphasized, under the incorrect assumption that errors of strip width and tally record are compensating. Since in a strip survey, the samples are continuous in one direction only, it is probable that conditions in that direction are represented beyond due proportion. It is, at any rate, vitally important that strips be run across contours, in consequence of which in mountainous country, at least, the direction of strips must be altered from time to time. The line-plot system overcomes these difficulties since the samples are taken at equal distances in each direction.

Yield tables for Canadian species are either absent or of very limited scope. As a simplified means of determining present rate of growth by a single examination the line-plot system seems to offer the nearest approach to a solution. Tables from the data obtained on line-plots may be prepared for each species showing the stand, the rate of growth for the past five or ten years and the approximate mortality for a like period from which may be deduced the net increment.

The line-plot system lends itself admirably to the periodic measurement of large plantations. In recording the rate of mortality or rate of growth of large plantations, it is impracticable to tally every tree; a partial tally, selected by personal judgment will be biased; selected by complete strips may be over-represented in one direction, and in consequence the effect of such factors as drainage slope, or wind may not receive due consideration. The line-plot system will obviate these difficulties, and at the same time make it possible to analyze the results, thus adding assurance.

Concluding, the line-plot system is not a substitute for standard permanent sample plots but an aid to them, particularly for the sampling of extensive areas where it is not economically feasible to establish

a requisite number of standard plots. The system is peculiarly adapted to statistical analysis. As a method of timber estimating on large areas, a comparatively small acreage need be sampled. Since the samples are selected equi-distant in each direction, each condition has equal chance of representation. The samples are small and consequently actually measured data, areas and stands are possible. Nothing need be left to personal judgment. Net rate of growth of species or types may be investigated by use of the line-plot system.

The foregoing are a few suggestions of the possibilities of the use of line-plot system in forest investigative work.

For a more complete discussion of the use of statistical methods the following references are submitted:

Bowley, A. L.—*Elements of Statistics*, Charles Scribner & Sons, New York.

Mills, F. C.—*Statistical Methods*, Henry Holt & Company, New York.

Wright, W. G.—*Statistical Methods in Forest Investigative Work*. Bulletin No. 77, Dominion Forestry Branch, Ottawa.

Yule, G. Udny—*Introduction to Theory of Statistics*, Charles Griffin & Co., London.

ACCURACY OF METHODS IN ESTIMATING TIMBER

By R. H. CANDY

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One of the main problems before foresters has been the necessity of obtaining an estimate of the huge forest areas that exist in this country. The means employed to obtain these estimates vary from the old timber cruiser's ocular estimate, which by the way, was often surprisingly accurate, to a complete tally of the whole area. While this latter procedure provides an absolutely accurate measure of the stock on any area, it is impracticable on large areas on account of cost. The ideal method of estimation survey, is one that will provide an estimate of reasonable accuracy at the least cost. It can readily be seen that any method of survey for which it is possible to calculate the accuracy of the estimate obtained, is very much superior to methods in which the accuracy of the estimate is doubtful and not at all calculable. For only one method of estimation survey is this possible. This is the line-plot survey. With all other methods of survey it would be necessary to accurately lay out and measure a portion of the area in order to obtain an idea of the accuracy of the kind of survey examined.

LINE-PLOT SURVEY

The system of line-plot survey differs from the ordinary strip survey in that the data collected is taken from accurately laid out plots at equal intervals along parallel lines, instead of from parallel strips the width of which are estimated by the eye of the cruiser. These plots may be permanent or temporary. Permanent plots are made when it is the intention of the management to make periodic measurements. They are then laid out and marked in such a manner that they can be easily found and measured. The size of the plots and the number of plots laid out is determined by the degree of accuracy required, the type of forest and the general composition and regularity of the timber growing in the forest. It is essential that all the plots must be of the same size and spaced regularly and in no way located by personal choice.

ADVANTAGES OF LINE-PLOT SURVEY

The following advantages of the line-plot survey over other forms of estimation surveys obtain:

(1) After a small amount of preliminary data has been collected it is possible to determine the number of plots necessary to obtain a certain specific degree of accuracy in the average.

(2) It is possible to tell at any time during the course of the survey what degree of accuracy in the average estimate has been obtained.

(3) Future periodic measurements of the plots, at least within reasonable time, will give the same degree of accuracy as the original survey, provided, of course, that the nature and composition of the forest has not changed to a radical degree by unusual events such as fire or excessive windfall or insect attacks.

The determination of the accuracy and calculation of the number of plots necessary for any precision in the average estimate is not very complicated. A dispersion table of the basal areas or volumes on the plots is made, and from this the standard deviation, standard error and number of plots are calculated:¹

Dispersion Table for Plots on Survey of Montgomery Lake, Petawawa.

Group basal area per plot sq. ft.	Frequency (n)	d—	(d—)n	d—	(d—)n	(d ²)n
13	2	5	10	..	..	50
12	5	4	20	..	..	80
11	12	3	36	..	..	108
10	13	2	26	..	..	52
9	22	1	22	..	..	22
8	22	..	..	..	..	..
7	13	..	..	1	13	13
6	16	..	..	2	32	64
5	5	..	..	3	15	65
4	4	..	..	4	16	64
3	1	..	..	5	5	25
2	1	..	..	6	6	36
	116		114		87	549

$$\text{Mean} = 0 + (D_0) = 8 + \frac{114 - 87}{116} = 8.23 \text{ sq. ft.}$$

0 = arbitrary origin

D₀ = difference between arbitrary origin and arithmetic average.

¹ "Use of Statistical Methods in Forest Investigative Work." Bulletin 77, Forestry Branch, Dept. of Interior.

S_n = Standard deviation

$$\pm \sqrt{\frac{\sum d^2}{n-1}} - d^2 = \pm \sqrt{\frac{549}{115}} - 23^2 = 2.17$$

Σ = Sum of

n = number

d = deviation of any one measurement from the arithmetic average or from the arbitrary origin.

Limit of error of 5% of mean = $\pm .41$ sq. ft.

S_e = Standard error must not exceed $\pm \frac{.41}{2} = .205$ sq. ft.

$$\text{Number of plots required} = \left\{ \frac{2.17}{.205} \right\}^2 = 111 \text{ plots}$$

COMPARISON OF SURVEYS

In order to examine the possibilities of this method of estimating timber and at the same time to test the accuracy of the more common survey systems, experiments were carried out during the summer of 1925 by the Research Division of the Dominion Forestry Branch.

The area selected was a stand of pure jack pine 1,200 acres in area, on a level sandy plain on the Petawawa Reserve. The stand was even-aged and established about sixty years ago, after a fire which swept over a large part of this region.

The following three methods of estimation survey were run over the same strips, each survey being independent of any other.

(1) Estimated 66-foot (one chain) wide strips—this is the ordinary strip survey in which the width of the strip is estimated by eye. All trees that fell within this strip were calipered and tallied.

(2) Estimated 33-foot (one-half chain) wide strips—this is the same as (1) except for difference in width of strip.

(3) Line-plot system as described above—plots are mechanically selected and accurately laid out at intervals of 10 chains. 116 one square chain plots were established which provided an estimate which was accurate within \pm or $-$ 5%, estimate being based on basal area square feet per acre of main stand.

(4) Accurately measured 66-foot strips. Every precaution was taken by means of blazing a center line, strings, tapes, chalking tallied trees, etc., to ensure the absolute accuracy of this control survey.

Each of these surveys was worked up separately. For the basis of comparison, the average basal area per acre derived from the four methods was used:

The following table shows the results:

Results of Surveys at Petawawa.

Method	Average basal area per acre sq. ft.	Percentage of strip area covered (120 acres)
(I) 66' strip (estimated).....	103.9	100.0
(II) 33' strip (estimated).....	91.6	50.0
(III) Line plot, 116 plots.....	83.0	10.0
(IV) Accurately measured 66' strip (control)....	83.5	100.0

Percentage Difference from Control (IV)

Method	Percentage
(I) 66' strip (estimated).....	+24.6
(II) 33' strip (estimated).....	+ 9.6
(III) Line plot.....	— 0.6

These results are supported by an experiment carried out on a small scale at the Lake Edward Forest Experiment Station in the Province of Quebec where the accuracy of the ordinary methods of timber estimating (No. 1) and (No. 2) were also tested.

For this purpose a mixed uneven-aged stand on very rough country was selected, 50 acres in area. Ten per cent or five acres were actually measured along blazed lines. The procedure was exactly the same as at Petawawa with the exception that there was no comparison of the line-plot survey owing to the smallness of the area covered, making it impossible to obtain in a practical method, enough samples to give an estimate as accurate as was required. The following table gives the results obtained:

Results of Surveys at Lake Edward

Method	Average basal area per acre sq. ft.	Percentage of strip area covered (5 acres)
(I) 66' strip (estimated).....	99.1	100.0
(II) 33' strip (estimated).....	90.3	50.0
(IV) Accurately measured 66' strip (control)....	81.9	100.0

Percentage Difference from Control (Method IV)

Method	Percentage
(I) 66' strip (estimated).....	+20.9
(II) 33' strip (estimated).....	+10.1

ANALYSIS OF RESULTS

It will be noted that at Petawawa and Lake Edward both the 66-foot and the 33-foot estimated strip surveys were too high. It will be further noted that in each district, notwithstanding the great difference in type and composition of the forest, the percentage of this error for either width of strip was practically the same, i. e., for 33-foot strip about 10 per cent; for the 66-foot strip 21 to 25 per cent. Finally, the greater accuracy of the line-plot method of survey at Petawawa is fully demonstrated, the error being less than one per cent.

PERSONAL FACTORS IN ESTIMATING SURVEYS

In order to discover the range of differences between two estimates of the same area and in order to throw some light on the question of the personal factor in a strip survey, a comparison was made between the estimates of two parties on the same strip. Two parties of two men made an estimate of a 33-foot strip along the same blazed line 90 chains in length. The estimates of the two parties are compared with an accurate estimate of the strip selected.

Results of Surveys

Method	Average basal area per acre sq. ft.	Percentage of strip area covered (9 acres)
(I) 33' strip (estimated by A).....	82.2	50.0
(II) 33' strip (estimated by B).....	115.0	50.0
(III) Accurately measured 66' strip (control)....	95.9	100.0

Percentage Difference from Control

Method	Percentage
(I) 33' strip (estimated by A).....	—15.00
(II) 33' strip (estimated by B).....	+20.00

The difference of 35 per cent between the two estimates seems unreasonably large, but it seems to indicate that the personal element is very strong. It would appear that an additional advantage of the line-plot survey lies in the fact that the plots, having been actually laid out by chain and compass and mechanically selected, reduces to a minimum the personal factor.

CONCLUSIONS

The conclusions that can be drawn from the experiment at Peta-wawa which by itself is complete and supported in part by an incomplete experiment at Lake Edward, appear as follows:

1. A 33-foot strip survey gives an estimate too high.
2. A 66-foot strip gives an estimate even higher than a 33-foot strip, illustrating the important point that, provided the system of survey depends on personal judgment, the wider the strip in a survey, the less accurate the estimate becomes.
3. A comparison of estimates by the strip method over the same area by two parties seems to indicate that the possibilities of a wide variation between individuals and parties is great.
4. The line-plot survey can be depended on to give as accurate an estimate as desired, both theoretically and actually.
5. The line-plot survey, because of the fact that area is actually measured and because what is measured is done so mechanically and accurately, provides an estimate independent of the personal factor.
6. Finally, the great advantage of the line-plot survey accrues, that with this system the accuracy of the estimate can be determined while with the strip surveys this is not possible.

TRAVELS AND TRAVAILS IN FORESTRY

By C. A. SCHENCK

Traveling is a good educator. What a college fails to supply, travel may furnish: a knowledge of men, a knowledge of affairs, a knowledge of conditions and, in addition, a stimulus for further study; and vision! For no profession is travel more important than it is for the profession of forestry, because none is more dependent than is forestry on the ever-changing conditions of the localities.

We can not transfer Swedish forestry into Maine or Saxon forestry into Pennsylvania. But we can and we should understand the conditions which underlie the system of forestry prevailing here and prevailing there, sometimes constructive, sometimes destructive, sometimes conservative, making that system which is found to exist in a given locality *the* system and the *logical* system of forestry, for the time being.

For the time being, indeed, it looks as if Einstein's law of relativity of site and relativity of time were applicable to forestry as much as it is to astronomy.

Travel is expensive; and yet it is the cheapest means of education for the traveler who has inherited from his parents or who has obtained through life and school and college that unique cerebral faculty which is yclept: "Power of observation."

Those who can not observe had better save their money, stay at home and learn from books.

In Europe,—in the civilized part of Europe—forestry seems to be firmly entrenched. Born from the fear of a fuel famine which was threatening to destroy life and civilization in the 18th century, European forestry continues to be extensified in area and to be intensified in skill. And yet, if we travel from Paris to Bordeaux, from Milano to Rome or from Frankfort to Cologne, we do not see any but "brush-forestry" practiced on farmers' wood lots. The president of an American university, returning from a trip abroad, was correct, probably, when he told the university convocation that he had not seen any "*forests*" in the old country. Indeed, nowhere is there practiced, on European farmers' wood lots, any "timber-forestry." The law of the land may insist on continuity of growth; it can not insist on continuity of timber. The farmer's wood lot is everywhere an adjunct to the farm; it supplies the farm with fuel, with repair material, with bedding and feed for

the stock. The farmer's wood lot serves the farm and it never serves the common weal. "Brush-forestry" answers the purpose.

Helas! Unless human-kind in America differs from human-kind abroad, we shall look in vain for timber-forestry to be practiced on farmers' wood lots which comprise, in America, one hundred and ten million acres!

There are, in Europe, a few and remarkable exceptions to the rule of farmers being adverse to timber-forestry: In Switzerland and in Southern Germany there are found some farms classed as "entailed"; there, the oldest or the youngest sons alone are entitled to succeed their fathers as proprietors. In these exceptional cases, timber-forestry *is* found on farmers' wood lots. The farmer's family living forever is the real owner; the proprietor is merely a temporary user of the forest.

In Germany and in Sweden we find some timber producing forests owned by farming communities duly supervised by a paternal state. Again, here, timber-forestry is possible and it is possible as long as the state is permitted to supervise the farming communities as if they were the wards of a guardian.

In Finland and in the German states, the local governments have favored farmers' cooperatives in a hope that timber-forestry might result from concerted and organized activities. So far, the successes have been meager. The farmer is recalcitrant, is reluctant when his independence is at stake; he does not care to surrender to a cooperative organization the sole control of his wood lands even if the cooperators are his neighbors, his friends, and his cousins.

Timber-forestry, admirable timber-forestry, is found on the large private estates owned by the aristocratic families of Austria, Czecho-Slovakia, Jugo-Slavia, Poland and Germany. Prior to the war these families were rewarded, if they were owners of timber-estates conservatively managed, by hereditary seats in the senate, by reduced taxation and by social prerogatives.

Helas! Helas! We in America do not want to have any Junker families! Nor do we see our way clear toward giving a permanent seat in the United States Senate to a man or to a family engaged in an enterprise as laudable as is timber-forestry. If we did, many a Vare and many a Gould might invest a dozen millions of dollars in American timber-forestry!

All the timber forests of central Europe owned by states, by towns and by families are traversed by permanent means of transportation (railroads and stone roads) built at the expense of the state and not

at the expense of the forest. This state-assistance is a wonderful advantage for forestry because forestry is a problem of transportation rather than a problem of botany. Accessibility spells value for seedling, sapling, pole and tree. Leading among European nations is little Switzerland which, today, contributes to forest roads privately built, out of national and out of state funds, as much as 90 per cent of the expense. Permanent roads and permanent forests are twins. The outcome of forestry depends on the price of stumpage. The price of stumpage depends on the cost of logging. The cost of logging depends on the presence or absence of roads. In European forestry, the expense annually incurred for roads exceeds the expense annually incurred for silviculture. The European forester is, incidentally, a road engineer and a road supervisor in the forests of which he has charge. In lieu of stone roads, permanent cable ways, permanent flumes, permanent splash dams, permanent floating ways are being built and maintained, notably in Fenno-Scandia, where the opportunity for water transportation is paramount. The Finnish nation, in opening its primeval north-woods, begins operations by establishing permanent roads and permanent water-ways. Were it not for the certainty, in connection with them, of the winter supplying for the skidder an unfailing sheet of ice and snow, there would not be any conservative forestry, today, in the north-woods of Fenno-Scandia. An annual layer of snow and ice, spring freshets sure to convey the logs, over runs up to one thousand miles long, to manufacturing plants situated at the harbor-mouths of the streams,—these are essentials for Fenno-Scandian forestry. Water connects; land separates.

Helas! We do not have anywhere in the United States such propitious conditions for forestry!

And Fenno-Scandia enjoys, after manufacturing its logs into lumber or into paper, the wonderful advantage of ocean transportation which conveys its wood goods from the harbor-mouths of the streams to destinations in England, Holland, France—and even in the United States.

Central Europe does not possess the peculiar winter- and the water-advantages of northern Europe. Central Europe possesses, however, other advantages in forest transportation: There are innumerable navigable streams—the Rhine, the Elbe, the Danube, the Oder, the Vistula, the Seine, the Rhone—fit for rafts of logs or for barges loaded with lumber. And there is a system of canals, developed particularly in France, which subserves forest transportation. After

visiting, in the course of the last thirty-two years, some fifteen nations of this world, I would answer the question for the countries most backward in water transportation by stating: "Most backward in the world are Russia and—with a sigh—the U. S. A." For successful forestry, water transportation is invaluable. Railroad transportation deducts from a possible stumpage price ten dollars more per thousand feet B. M. than does water transportation when distances of one hundred to one thousand miles are at stake.

Helas! We do not have any American system of canals or of navigable streams, nor do we have any government railroads granting to forestry—as is done in Central Europe—exceptional rates for the home-grown products of the woods!

All over Europe the state tries to prevent an unlimited production of logs. To that end, an export duty on logs and on mine props is levied in Poland, Czecho-Slovakia and Finland; and wherever there is a legal chance for the state, it tries to prevent the owner from cutting annually more timber than the equivalent of annual new growth.

Helas! We in America, under the Sherman Anti-Trust Law, follow the opposite course. When the owners of timber lands try, by concerted action, to equalize demand and supply, the attorney general will shake his fist, threatening them with a term in Fort Leavenworth.

Economically, the main stay of European forestry is, from the Ural to the Pyrenees and from the Balkans to Bergen, the positive stumpage value of fuel wood which, in America, is waste or waste product. Over 60 per cent of the products of European forestry are fuel wood used, in lieu of coal, on an enormous scale. It must be remembered that Sweden, Norway, Finland, Switzerland, Russia, Austria, Italy and Spain are without coal. If coal were everywhere available, the remunerativeness of European forestry would be everywhere crippled. In Fenno-Scandia the majority of the locomotives are fed on fuel wood.

Helas! We in America are richer in coal than is the rest of the world taken together, and our potentialities of fuel wood are going to waste!

Some wise and doctrinarian Americans have been advocating vociferously "the United States of Europe," for the benefit of perpetual peace. The underlying idea is good. Interstate commerce, free from any national rivalry, tends to preserve good will by underscoring the dependence of one state on the productiveness of another.

If, however, this happy and peaceful condition of affairs were to prevail in Europe, the remunerativeness of timber-forestry, in France and in Germany, would come to an end. This remunerativeness is produced and is maintained by a tariff on importations coming from sections where primeval forests supply the timber, supplying it at no cost of production.

How is the situation with us?

Helas! Forestry in New Hampshire, productive of white pine, competes with destructive lumbering in Idaho, also productive of white pine; and the dice are loaded against forestry in New Hampshire. And, further, oak imported from Japan to San Francisco competes successfully with oak produced in the American Appalachians. Two hundred million dollars are spent annually on news print coming from Canada which news print might as well be obtained from the spruce forests in the three northwestern states of the Union. Not long ago a wealthy New Yorker told me that he was considering an investment in Mexican pine situated close to the international border; several hundred thousand acres were offered to him at a nominal figure. "I believe that the American pineries will be exhausted within twenty years; and at that time my Mexican investment must prove its worth." That was the New Yorker's opinion. But what about American forestry? *Unless a high tariff protects it against importations from foreign primeval woods, what is the sense and what is the use of investments in American forestry?*

Some Americans seem to imagine that European taxes on forestry are light. That is not the case. A few examples: Prior to the war, in the German Rhine Valley, the average tax on second growth was 50 cents per acre a year. Today, after the war, between 40 and 60 per cent of the net income derived from forestry is absorbed by property tax, ground tax and income tax. In Sweden and in Finland, every forest owner complains of the severe pressure of forest taxes. If we hear little about this in America, the reason lies in the fact that our connection is with European state foresters rather than with European private owners. The European, however, enjoys a distinct advantage in forest taxes over the American: In America when a second growth forty years old is destroyed by fire the taxes paid on it during those forty years are going up in smoke. In Europe, forest fires do not exist, practically speaking, because Europe is a country of summer rains. The largest fire of record in the annals of the Black Forest occurred in 1801 at a time when the woods were still primeval. Six thousand

acres of stumpage were destroyed by that unprecedented fire! In the pine thickets of France (Landes), of Prussia (Silesia) and of Bavaria (Nurnberg), fires occur from time to time. A fire burning two hundred acres, in these cases would be classed, however, as unparalleled in the world's history.

Helas! We can not change our American climate; and it is hard to change traditional American carelessness with forest fires.

The European, indeed, enjoys wonderful advantages: Ease of logging over permanent roads; local markets for fuel wood; short shipping distances; water routes; limited competition; tariff on importations; no interstate commerce; no danger from fires. Thus it is that European forestry is strongly intrenched! And yet, and yet, and yet: *Even in Europe there does not seem to be any money in timber-forestry.* It is practiced, on the whole, by public institutions; there does not exist any commercial company engaged, purely and simply, in the production of timber; the dividends obtainable from timber-forestry, according to European statistics spanning many decades of years, do not exceed $2\frac{1}{2}$ per cent annually which figure may be augmented by latent dividends of $1\frac{1}{2}$ per cent obtained from rising prices of stumpage. Unfortunately the trees do not grow anywhere, in America as little as in Europe, at an average rate such as the American investor demands from his investment. If that is so, how can we entertain any hope for American commercial forestry when the bonds and the mortgages necessarily appearing among the liabilities of a forestry company can not be obtained at a rate smaller than 8 per cent? How can we hope for forestry and for its financial success when 50 cents per acre annually paid, during a forest-adolescence of some seventy-two years, for protection, for taxes and for administration, accrue at the rate of 8 per cent to \$1,600 per acre and when these many dollars might fall, on any summer day, a prey to a forest fire?

Insurance against forest fires will not help. Insurance is nothing but a means of distributing losses; it augments an average loss by administrative expense. A forest company must be so large that its annual losses will be automatically distributed without necessitating the help of an insurance company; it should imitate the practice of an American railroad which does not think of ever insuring, against destruction by fire, its station houses, its freight cars or its locomotives. The average loss is annually charged against equipment. And the average loss, from year to year, remains about the same.

What is the conclusion?

Firstly: European travel shows forestry to be the outcome of local and peculiar conditions, many of which are absent and will remain absent from the U. S. A. Nowhere in Europe is there any forestry practiced as a merely commercial venture or as an investment expected to yield a satisfactory dividend.

Secondly: Forest research in America should devote more attention to economics, to business, to balance sheets and to financing than what it devotes to botany, to chemistry, to climatology, to timber physics and to yield tables. All of which are good; but they can be applied solely to those forests which we shall have hereafter.

Thirdly: American foresters should turn to politics, which is to law-making. It was by propitious laws that our system of railroads, of national banks, of national forests, of huge industries such as U. S. Steel, General Electric, Allied Chemistries, etc., were created. We can not hope to see commercial forestry companies established unless laws are enacted supplying a safe basis for their development.

The nation is all-powerful: It can kill an industry by adverse legislation as it has killed the breweries. It can raise an industry by favorable laws as it has raised the steel and the chemical industry; and it can prevent, by sheer negligence, the most desirable industry of any—commercial forestry—from ever surviving an endangered infancy or a tottering adolescence.

Politics are needed. Where would we be in American forestry had it not been for the casual coincidence of one Theodore Roosevelt and of one Gifford Pinchot, the coincidence of two politicians neither of whom was a scientist in forestry?

We can not have any state forests, we can not have any town forests, and we can not have any family forests of a size covering two hundred million acres of potential American timber land, now privately owned; and we are not Bolsheviks enough to desire the establishment of another two hundred million acres of national forests. Thus there remains but one possibility: *Commercial forestry companies, favored and chartered by national laws, must be formed by private capital; and the stocks and the bonds of these companies must be made as attractive for the investor as are those of our railroads and of our industries.*

To that end, indeed, national laws are required. The Clarke-McNary federal law of 1924 is a step—30 inches long—in the right direction toward a goal a mile away.

Our foresters and their friends are idealists and are enthusiasts:

What can, however, enthusiasm do towards a change of economic conditions? What is the effect of "*arbor days*" and of "*forest weeks*"? Were our railroads established by annual "*rail-days*" or our steel industry by annual "*steel-weeks*"? No! The juvenile enthusiasm of boy scouts and the amateur enthusiasm of women's clubs and sporting clubs will not cause any capital to stream into commercial timber-forestry; the certainty of safe and of good dividends alone will do it; *capital must be enthused for commercial timber-forestry.*

No one can supply this certainty and this enthusiasm unless it be the nation, assembled in congress and in senate.

Will congress and senate do it?

I doubt it.

They can not be expected to know the economic uniqueness of commercial forestry; it is hard enough for them to understand the economic uniqueness of commercial farming; the owners of woodlands have never clamored for help; and the foresters—have failed to travel.

VOLUME PRODUCTION IN FORESTRY LITERATURE

By ROBERT MARSHALL

Northern Rocky Mountain Experiment Station

With its December, 1926, number, the JOURNAL OF FORESTRY completed ten years of existence. A decade is a favorite period for résumés, and so this would appear to be a good time to compile a few statistics on the Journal's literary output. It was therefore chosen to investigate that branch of the subject dealing with volume production; in other words, to determine who have been the most prolific contributors to forestry's technical magazine.

The point of greatest interest, of course, is to find the most voluminous author; the Zane Grey, as it were, of forestry literature. This honor falls to Theodore S. Woolsey, Jr., who has a total of 19 contributions in 10 years. Not far behind comes H. H. Chapman with 15, while B. P. Kirkland is a close third. But the details of the leading contributors will be found in Table 1, which lists all those who have had six or more articles printed in the Journal. This table does not include reviews, notes, or committee reports.

TABLE NO. 1
Leading Contributors to Journal of Forestry, 1917-1926

T. S. Woolsey.....	19	S. B. Show.....	8
H. H. Chapman.....	15	J. D. Guthrie.....	7
B. P. Kirkland.....	14	R. S. Hosmer.....	7
Russell Watson.....	12	Aldo Leopold.....	7
H. C. Belyea.....	11	P. S. Lovejoy.....	7
Donald Bruce.....	11	J. W. Toumey.....	7
R. C. Hawley.....	11	W. W. Ashe.....	6
E. N. Munns.....	11	S. T. Dana.....	6
F. E. Olmsted.....	10	E. H. Frothingham.....	6
F. S. Baker.....	9	H. S. Graves.....	6
E. C. Behre.....	9	J. S. Illick.....	6
Herman Krauch.....	9	E. F. McCarthy.....	6
C. G. Bates.....	8	L. S. Murphy.....	6
Austin Cary.....	8	J. F. Preston.....	6
A. B. Recknagel.....	8	Edward Richards.....	6

It is interesting to note in what phases of forestry these leading contributors to the Journal are engaged, or were engaged while they were doing most of their writing. This information is given in Table 2.

TABLE NO. 2
Occupation of Leading Journal of Forestry Contributors

Teaching.....	11
Research.....	10
Consulting forestry.....	4
Administrative work.....	3
Public relations.....	2

Thus 70 per cent of the most profuse Journal authors have been engaged in research or teaching, while only 10 per cent have been administrative men. This sharp division is even better illustrated by an analysis of the literary output of those holding the highest forestry posts in the country. Table 3 shows the number of men in various prominent positions who have contributed two or more articles to the Journal.

TABLE NO. 3
Contributions of Prominent Foresters

Position	Total Number of Men in This Position	Contributors of Two or More Articles	
		Number	Per Cent
Experiment Station Director.....	9	8	89
Head of Forestry College.....	21	7	33
Assistant Forester, U. S. F. S.....	7	1	14
District Forester, U. S. F. S.....	8	1	12
Head of State Service.....	33	4	12
Assistant District Forester.....	34	3	9

All of which recalls to mind what Cotta said more than 100 years ago, that "the forester who practices much writes but little, while he who writes much practices but little."*

COMMENT BY H. H. CHAPMAN

Contributions to the literature of a profession must come from those who are willing to make the effort to put their ideas into systematic shape and present them for what they are worth. Selection for publication must rest on the editor. The sources of information lie in the fields of contact with reality, whether this be silviculture, fire protection, lumbering or economics and management.

The performance of manual labor or routine office work does not in itself qualify a forester to write for publication,—but if this is accompanied by close observation and correlation of ideas, may give birth to a very fertile literature, a good example of which is Ranger Walter L. Perry, formerly of District 3.

In every profession, the teacher is forced to systematize his information, and dig for fundamentals, whose value if any lies in being

* Or is it, to put a more modern interpretation, that some foresters who write but little also practice but little and therefore have little or nothing to write about?—Editor.

generally known and accepted, which naturally leads to efforts at securing publication. Thus it happens that in law, medicine, and engineering in the applied sciences, the output of textbooks and articles by those connected with educational institutions is far more prolific than from the remainder of the profession. The typical administrator considers it a waste of time to indulge in any activity not directly productive of increased efficiency in the organization unit of which he has charge. The exception is rare, hence the barrenness of this field. Many scientists, on the other hand, are consumed with the zeal for disseminating their discoveries, hence we find them writing voluminously,—a good example is Luther Burbank, one who both practiced and wrote much. Another was Charles Darwin, and a third, Louis Agassiz.

The forester quoted as the Zane Grey of forestry literature has spent his entire career except for one year in public and private practice of forestry and is now so engaged.

At the annual meeting of the Society of American Foresters at Philadelphia in December, Dr. C. Alvin Schenck made certain statements to the effect that the practice of forestry by private capital was impossible anywhere in the world. At the suggestion of one of the professors present, it was left to the private foresters who might be in the audience to answer this challenge. The results were extremely disappointing, as the three or four who spoke could not or did not go beyond their own narrow horizon of experience, and the bluff was not effectively called.

In the grazing testimony at Washington last year before the Senate Committee, the chairman stated that in his opinion no one who had not been an owner of stock on the open range was qualified to testify as to the effect of grazing livestock on the National Forests.

In the future it is to be expected, and statistics already show, that research men will become heavy contributors to forestry literature, yet this class of foresters should have practically no duties of an administrative character,—they should practice no forestry.

The Journal should more and more be enriched by carefully prepared, enlightening articles from practicing foresters who have the ability to use their eyes and reasoning powers. Had there been a greater supply of such articles in the past, perhaps the above interesting statistics might have refuted Cotta's century old comment on human nature as applied to forest literature.

A METHOD FOR RAPID SURVEYS OF VEGETATION

By W. C. LOWDERMILK
University of Nanking, China

The method of measuring vegetation and the surface conditions of soil which the writer has employed over a period of five years through a varied type of conditions may be of interest to foresters and ecologists. While engaged in the Minimum Requirements Study¹ in northern Idaho, 1921, the approved methods of measuring the restocking of forest stands proved inadequate. When the writer was confronted at one time with such tasks, for example, as the determination of the restocking on four townships of cut-over and burned-over land in the vicinity of Boville, Idaho, the task of counting reproduction even on 1/16 acre plots on line surveys was overwhelming. Two crews could have spent six months steady work tallying seedlings on a five per cent reconnaissance of this area.

Even more than the undue time requirement of the method of counting reproduction, it failed to give a true representation of restocking. There was always the tendency and danger to make inaccurate and superficial counts. For a time the writer made counts by estimating the average spacings between plants on plots. The numbers per plot were read off from a prepared table. Such devices to speed up the work were used until on one particular chain, a situation was encountered which brought into clear relief the inadequacy of the methods employed. That chain of the transect survey had fully 200 seedlings bunched within a space six feet square. The remainder of the chain was burned bare. If this number was used in averaging the stocking per acre, the average would be grossly misleading. Most important, it was quite obvious that the 200 seedlings would never develop into more than one tree on that space of ground. The tree seedlings, therefore, could not be safely used as a unit of stocking. Stocking on an area basis would be more representative of actual conditions.

Starting at this point, the following method based on area as the unit of stocking was evolved and employed in the remainder of the reproduction reconnaissances.

¹The Minimum Requirements Study was instituted by the United States Forest Service to determine within the United States the minimum measures which would insure continuous forest production on cut-over lands. (1921 following.)

The Milacre: A plot of one-thousandth of an acre was selected as a unit of stocking. This plot is 6.6 feet square, being one-hundredth of a square chain. For convenience it was called a "milacre" and will be so referred to subsequently in this paper.

A number of considerations were involved in fixing upon the milacre as a unit. At first it seemed too small for the purpose in hand, for it represented a denser stocking of trees than is used generally in planting; furthermore, the final stand could not contain a tree for every milacre. Over against these objections were certain advantages: The stocking of every milacre represents the return of a closed stand and of forest conditions, which could be considered as the ideal stocking; the milacre would give true representation of dense natural reproduction than a larger unit; finally, the convenience in expressing milacres decimally in acre units was a very important advantage in calculations and summations.

The Note Book: The employment of the milacre in surveys required a special ruling of the note book, which the writer has generally done free hand quite satisfactorily. But special books may be prepared for milacre surveys, which at the same time does not interfere with uses for other data.

The left hand page is ruled in wide ranks and columns. On this page are recorded the serial number of the chains in the transect survey, as well as the gradient, aspect and general soil and rock description. Mapping data are also included here. Tallies of trees on a chain wide transect may also be included here. Such may include a tally of standing living and dead, and down material as the demands of the survey warrant. A listing of vegetation by species may be made conveniently for each page which represents a five-chain section of the transect. More frequent descriptions may be employed if changes in type of vegetation call for them.

The right hand page is ruled into columns and ranks with 10 rulings for each chain, representing milacres. The page may be divided into two parts; the left being reserved for tree species and the right for surface conditions, such as duff cover, surface rock, burned surface, mineral soil, slash or débris, and similar items which are required to picture surface conditions.

The Crew: The crew consists of two men: a compass man and rear chain man. The compass man is also head chain man, carries the note book and tallies the readings made by the rear chain man. The rear chain man carries an Abney hand level with which he deter-

mines the slope gradient, determines the slope distance from a table and measures out this distance. He has a milacre stick which may be made of light strong wood $1\frac{1}{4}$ inches square and 6.6 feet long. It has been found convenient to write the table of slope distance equivalents on the milacre stick which saves the time of referring to a book. When the forward station is set and the head chain man is ready to tally the rear man extends the milacre stick along the chain, makes a convenient mark, quickly grasps the milacre stick at the center and walks forward sweeping it at right angles to the chain over the ground to the mark first made. As this is done the space is intently observed and readings called out. The space thus covered is a milacre. The readings are called as he proceeds for each milacre by number until the end of the chain is reached. The spacing of the milacres is thus checked at the end of each chain. The head chain man goes forward on the line another chain and so on.

Recording the Data: Recording is the important feature of the method and can be adapted to a rather wide range of conditions. For a reproduction survey only, it is merely necessary to record that each milacre is stocked with tree plants, regardless of number, or not stocked.

Stocking to different species may be indicated by using columns for each species. If a further refinement is desired the stocking may be indicated by symbols to represent 1, 2 to 5, and over 5 plants per milacre. Greater refinements are not advocated, nor are practical. Even this refinement will be used only in special studies. Age classes may be represented by convenient symbols.

The surface conditions may be read off in tenths of area, for rock surface, for burned area, for duff surface, for herbaceous vegetation, and for other features which are to be measured. A column must be reserved for each factor measured.

The milacre is subject to estimation. But with the constant check of the milacre stick for length and width, the errors are compensating. After some practice one may advance at the pace of a slow walk and survey two miles per hour of continuous line.

Usually when milacre No. 5 within the chain is completed and before No. 6 is read, a halt is made to tally the trees on the square or circular chain or larger unit. The dimensions are conveniently checked by pacing, but practice will enable one to estimate the limits of the square or circular chain by using the one-half chain distance to the head chain man as a guide.

Calculations and Summations: The summation of the data on each sheet is the most striking advantage. The number of stocked milacres for each column is totaled at the bottom of the page. These figures represent the milacres of stocking for each species and may be converted into the number per thousand or per centum mentally.

To determine the stocking to all species each milacre rank is followed horizontally through all the species columns. If one or more species of tree plants occur in that milacre rank, a symbol is recorded in the narrow column reserved for this purpose. Otherwise this space is left blank. When these symbols are totaled at the bottom of the page the total number of milacres stocked by all species is indicated. When the sheet contains a five-chain section of the survey, 50 milacres are surveyed. Doubling the totals at the bottom of the page indicates the milacres stocked per centum; multiplied by 10, the stocked milacres per thousand, or per acre.

The columns showing the surface description in tenths of area are totaled and the percentage of each type of surface determined. The page totals are summarized; the stocking in milacres per thousand per acre, or in per centum and the percentages of various surface conditions are quickly calculated.

If desired, it is possible to isolate the stocking by exposures or the occurrence of other conditions which often proves very illuminating. Age classes may also be indicated if desired. The writer has used the method under a wide variety of conditions quite satisfactorily, and also for young stands of timber and for bamboo stands. In the latter instances it proves necessary to estimate the width of 3.3 feet on each side the tape.

Application: This method of measuring vegetation and reproduction has its limitations. It can not be used for the basis of exact recounts as is desired in permanent sample plot work. But when a picture of reproduction, of surface conditions, of the occurrences of seedlings by types of surfaces, and similar information the method has proved rapid and dependable. It is more satisfactory and accurate than any other method which has been employed by the writer. On large areas it is necessary to sample the area on a large scale to secure dependable results. The method employed must be rapid and must not be liable to a large error. The multiplication of samples is a much surer way of reducing the probable error of application than the refinement of measurements on a small number of samples. With practice the error in estimating the fractions of surface area

and conditions should not exceed ± 10 per cent. The condition of being stocked should never be missed if more than two plants occur and seldom if less. The presence of one plant should not be missed more than in two per cent of the cases, which should fall below 0.5 per cent of all stocked milacres.

If a standard deviation of 10 per cent for the surface estimations is allowed which is well within the limits of estimation on such small areas, the multiplication of samples rapidly reduces the probable error of the method.

$$PE = \frac{Sd \times 0.6745}{\sqrt{n}} *$$

When SD = 10 per cent, and $n = 100$

$$PE = \frac{10 \times 0.674}{\sqrt{100}} = .67 \text{ per cent}$$

When $n = 10,000$ the $PE = .067$ per cent. The multiplication of samples which is only possible by rapid work is an important safeguard of the reliability of the method.

This method was used by the writer in the latter half of the Minimum Requirements investigations in northern Idaho and western Montana, and has been used in China to study the vegetation of temple and remnant forests and mountain areas. This method is offered for a trial by other foresters and ecologists who are engaged in descriptive studies of vegetation and surface conditions on a large scale.

* Peters formula.

REVIEWS

Comments on Bates' Review of "Determination of Increment in Cut-over Stands of Western Yellow Pine in Arizona." By Hermann Krauch, Jour. Agr. Res. XXXII 6, March 15, 1926. Pp. 501 to 541.

In his review* of this paper Bates has criticized the method proposed, maintaining that it is wrong in principle. He states that "erroneous principles should not guide the initial steps, for these steps can not be recalled 10 to 20 years hence. . . ." In this respect Bates is right. It was, in fact, with this very same thought in mind that the author advocated the method described in his paper. Briefly stated, this method consists of the application of the growth of average trees to stand tables.

Bates' chief criticism of the method is that the growth data will not be generally applicable because of variations in the degree of stocking in stands. It is, however, because of these variations in stocking that the method should be better suited for determining the increment of stands, than the usual area method based on sample plots. It should be understood that the uneven stocking of yellow pine stands in the Southwest is chiefly a matter of variations in the size of the openings. This is especially true in cut-over stands. Although these openings obviously do have some effect on the rate of growth of trees in the stand, their effect is not proportional to their size because there is a limit to the root spread of the trees. It is not so much the size of the openings, as the size of the tree groups that should be considered. In a very small group, for instance, the average growth per tree will doubtless be found to be somewhat greater than in a large group, because in the former, the number of trees with roots extending into the openings is proportionally greater than in the latter. Errors arising from this source should, however, be compensated if the growth data are obtained from different sized groups. The densities of the various age groups are, however, about the same regardless of the size of the groups. It therefore appears that so far as yellow pine stands in the Southwest are concerned, Bates' argument against the method on the score of variations in stocking, is not tenable.

Bates also objects to the method because the growth data can not be applied to stands in other localities. It is not understood why it should be necessary, not how it would be possible to apply data that were collected elsewhere. What Bates probably has in mind is the cor-

* Journal of Forestry XXIV 6, Oct., 1926.

relation of yield data for a given species based on the average height of dominant trees. It is conceivable that such correlation should apply to even-aged and fully-stocked stands even though these stands occur in different regions. But, for many-aged and ununiformly stocked stands, and especially for cut-over stands of this character, there would seem to be no logical basis for correlation between data for different regions. This would hold true even for stands within the same region if there are wide variations in the degree of cutting.

As to Bates' argument against the method of selecting sample trees, there is perhaps some justification. He states that it is "humanly impossible to choose 'average' trees even when such an arbitrary basis is set down as the taking of every fifth tree for a sample." However, this does not agree with the method of selection I have in mind. By simply measuring every fifth tree there is no assurance of having the different diameter classes and crown classes represented in their correct proportions. Consequently the growth data, even though based on many trees, might still be wrong. Such an arbitrary method would probably also involve the measurement of more trees than is necessary. On the other hand, by selecting a definite number of trees of each diameter class and also of each crown class, the data can be *used* to determine the average growth of all the trees in the stand. This is accomplished by weighting the values for the different crown classes in proportion to the number of trees in each class as they actually occur in the stand. The method can be carried a step farther by selecting the trees with reference to age-classes and then computing the average growth of the trees in each diameter class by weighting the values proportionally, as for crown classes. However, in segregating the data by age-classes, it should be sufficient to classify them on the basis of young, intermediate, mature and overmature; or even two classes, as mature and immature, may be sufficient. In the case of western yellow pine stands such a distinction is readily made on the basis of bark color. For other species there are probably other characteristics by which age-classes may be broadly determined.

Whether this method actually yields accurate results must, of course, be proven. Moreover, since it involves a great deal of personal judgment it ought to be tested out on each major project. In other words, for two or more periods, remeasure *all* of the trees as suggested by Bates. If it is then found that the data compiled on the basis of selected trees agree with the averages derived from the measurement of all trees, subsequent remeasurements of all trees might safely be discontinued.

As evidence that the selective method will give erroneous results, Bates cites the data given in Table III of my article. Although it is true that I presented these data in order to show that the growth of average trees might be determined on the basis of a limited number of measurements, I also perceived the danger of depending upon trees selected *en masse*; as for instance, in this case, in which all trees on "intensive" sample plots were used as a basis. Accordingly, I recommended that, "intensive sample plots should be dispensed with altogether and instead, trees well distributed throughout the stand should be selected for measurement." (Page 513.)

With Bates' suggestion to use the mean result of two methods of determining the increment, I can not agree. The two methods are: 1, the growth of average trees applied to stand tables and 2, the area basis; that is, increment per acre as determined from sample plots. The second method will give absolutely erroneous results unless both the number of age-classes and the areas actually occupied by them are the same on sample plots as on the larger areas to which the increment data are to be applied. The fact that the total initial *volume* per acre might be the same on the sample plots as on the larger areas gives no assurance that the *increment* per acre will be the same. Moreover, on the sample plots, the percentage of unstocked area is likely to be different than on the larger units. It appears that Bates, in advocating the area method, does not distinguish sufficiently between even-aged, uniformly stocked stands and many-aged, ununiformly stocked stands. There would, moreover, seem to be no object in using the area method when the other is used because this also gives the increment per acre, although arrived at indirectly.

The minor points criticized by Bates will now be briefly discussed. Referring first to his statement regarding mortality; namely that "it makes a good deal of difference in the calculation of volume losses whether trees die at the size originally measured, or at a considerably larger size 20 years later." He refers to my recommendation that all trees on the extensive plots or strips be tagged so that it will be possible to determine the original diameter class to which each dead tree belonged. This information is needed so that the original stand table may be modified accordingly. It was not intended to imply that the mortality would be figured on the basis of the original diameters. The dead trees should actually be measured and the loss calculated according to the diameters attained by them up to the time of death.

Regarding the method of determining the increase in volume by

projecting the diameter values on a previously constructed volume curve (Fig. 4) Bates' criticism is probably warranted. However, although the point is not clearly brought out in the text, this method enables rapid determination of the new volumes without further compilations. That is, after the increases in volume have been plotted by projection of the diameter values, the new volume curves can be drawn direct.

It is hoped that these comments will serve to clear up any points which were obscure. Further criticisms of the method proposed are also invited; for, as Bates has rightly pointed out, we should be sure that the principles we apply are correct.

H. KRAUCH.

Soil Temperature as Influenced by Forest Cover. By Tsi-Tung Li, Yale University: School of Forestry, Bulletin 18, New Haven, 1926.

This very creditable research bulletin gives the results of work done under the direction of Professor Toumey, in the Keene, New Hampshire, forest, toward a doctorate. Although nothing unexpected is brought out in this report, and the conclusions drawn from the data are stated with perhaps too great modesty, nevertheless this is a valuable small contribution to our knowledge of the variations between open and forested conditions. As pointed out in the introduction, soil temperatures, especially those occurring near the surface, play quite important roles in seed-storage and germination and in the survival and later growth of seedlings, while even those at considerable depth must be conceded to affect root growth, bacterial activity, etc.

Stations were established in each of four site conditions, namely, an artificially denuded area, a grassy area, a stand of young white pine, and a stand of old white pine. About twice as much light reached the forest floor of the old forest as in the young one. At each of these stations maximum and minimum-registering thermometers were placed on the surface and at depths of 6, 12 and 24 inches. Air temperatures, evaporation, and soil moisture during dry periods were also studied sufficiently to show the correlation of each with soil temperatures. The main observations of soil temperatures were made daily from July 1, to October 31, 1924, a period of only four months, which entirely omits the spring period when perhaps the greatest differences between the stations might be noted.

The surface temperatures recorded are especially significant because of the possible injurious effects of high maxima. Thus the

highest single temperatures recorded at the four stations, (in the order given above), were 136°, 101°, 71° and 78°, while the average daily maxima for July, the warmest month, were 118.8°, 88.6°, 65.2°, and 63.8°, respectively. The effect of overhead cover is here clearly shown, but this is of no greater significance than the effect of any sort of ground cover in preventing the occurrence of excessively high temperatures, the grass cover in this instance having reduced the liability by 35°F., in comparison with the perfectly barren area.

This difference between the surface temperatures is reflected even at the greatest depth, 24 inches. The denuded station shows July means of 70°, 68.3° and 63.4° for the successive depths; the grassy station, 68.4°, 65.1° and 61.6°; the young forest 57.4°, 56.0° and 53.8°; and the old forest 57.4°, 56.5°, and 54.0°. Both of the last two show somewhat higher temperatures in August than in July, either because of accumulating effect or because of the location of openings in the canopies.

Particularly interesting is the decreasing daily fluctuations of temperatures both with greater depths and greater amounts of cover. At the denuded station, the daily range is but one-half as great at 12 inches as at 6 inches, and but one-fifth as great at 24 inches. The mean daily range in July, at six inches, was 7.93° at the denuded station; 7.02° under grass; 2.65° under the young forest; and 2.47° under the old forest.

The data are tabulated in a great variety of ways for comparison. One rather severe criticism of the bulletin is the large number of small tables (61 in all), which might have been combined into about a dozen with saving of the reader's time and mental powers.

The method employed to obtain readings of maximum and minimum soil temperatures below the surface deserves special mention, since the reader may well be inclined to criticize it and will experience some difficulty in finding the evidence which indicates that no serious error was introduced thereby. It is well known that the most reliable registering thermometers must lie horizontally. Therefore, a considerable excavation was made at each station, auger-holes were made in the walls of these "cellars," running horizontally at the three depths desired, and the thermometers were pushed into these holes a considerable distance. We find no direct evidence as to what this distance was except the mentioning of 2.5 feet in connection with Figure 7. Elsewhere it is shown that when the thermometers were placed more than a foot from the wall, the air temperatures in the boarded-over cellar had slight, if any effect.

C. G. BATES.

Utilization of Dogwood and Persimmon. By John B. Cuno, U. S. Forest Service. Bulletin No. 1436, U. S. Dept. of Agri., Washington, D. C., Sept., 1926. Pp. 42, Figures 24, Table 4.

One correctly assumes that when two such unrelated woods like dogwood and persimmon are discussed jointly in one bulletin they must possess similar properties and have like uses. The preparation of this bulletin evidently was brought about by a curtailment of the supply of dogwood and persimmon and a desire to bring about better standards of utilization to conserve present supplies. The bulletin, an excellent example of the improved type of government bulletins, is an interesting commentary on the special technical qualities one might find in minor woods and the characteristic American waste of forest products.

There is not much dogwood and persimmon in America and the consumption is small as compared to that of other hardwoods, but they happen to possess the required properties better than other domestic woods for such exacting uses as textile shuttles, golf club heads and other specialties. The stand of commercially available dogwood is estimated at 231,000 cords and of persimmon 600,000 cords. Based on the consumption in 1923 of 15,500 cords of dogwood, the supply of this wood should last 15 years. Of persimmon 8,000 cords were consumed for dimension stock in 1923. Ninety per cent of the dogwood and about 83 per cent of the persimmon was used for shuttle blocks. Approximately 17 per cent, or 1,350 cords, of the persimmon was used for golf club heads and shoe lasts. In 1924, dogwood bolts brought from \$12 to \$25 a cord delivered at the block mill. "At present the manufacture of blocks is entirely separate and distinct from the manufacture of shuttles."

It is interesting to learn that of the 5,000,000 to 7,000,000 dogwood and persimmon shuttle blocks produced annually about 60 per cent are exported. From the remainder are manufactured and used in this country about 2,000,000 shuttles—78 per cent of dogwood and 21 per cent of persimmon, the other one per cent being of imported boxwood. While dogwood is preferred for shuttles, the bulletin gives several reasons why the persimmon is replacing it to some extent, availability and grades being of considerable importance in this respect.

The bulletin describes the trees as to their occurrence and growth habits, and the wood as to its appearance, structure and physical and mechanical properties. Considerable space is given the harvesting of the trees and the manufacture and seasoning of the blocks, both at the block and the shuttle mill. The manufacture of shuttles and a descrip-

tion of the special requirements of a wood to be suitable for blocks is also given, and there is included some good comments on the manufacturing wastes. Products other than shuttles—spool and bobbin heads, pulleys, skewers, mallet heads, golf club heads, shoe lasts, etc., are given brief but adequate attention.

The bulletin closes with an all too brief consideration of substitute woods, although here the author undoubtedly found data lacking. Two of the woods listed as possible substitutes—madrone (*Arbutus menziesii*) and Oregon myrtle or California laurel (*Umbellularia californica*) should, in the opinion of the reviewer, be promising substitutes. They grow larger and are perhaps as abundant on a board foot basis as the dogwood and persimmon now used. The madrone has much the same appearance and properties as the dogwood, while the laurel resembles the persimmon. The reviewer has several times in the past two or three years attempted to interest lumbermen in sending a sample shipment of blocks of both these woods to a shuttle mill in the East which promised to try them out, but exactly as Mr. Cuno reports was the case among southern pine operators in their past attitude toward dogwood, so the western operators evidently look upon the madrone and laurel mixed with their softwood as “small potatoes” and not worth bothering about. Both madrone and laurel wear smooth in service, the laurel particularly being well known for its wear resistance and “slick” surface.

It would have added to the usefulness of Bulletin 1436 if there had been included a list of block mills so that owners of tracts of dogwood and persimmon could get in touch with possible purchasers, and a list of shuttle mills to which the owners of substitute woods could go for trials of their woods.

January 12, 1927.

E. F.

Red Alder of the Pacific Northwest: Its Utilization, with Notes on Growth and Management. By H. M. Johnson, E. J. Hanzlik, and W. H. Gibbons. Bulletin No. 1437, U. S. Dept. of Agri., Washington, D. C., Sept., 1926. Pp. 45, Tables 18, Figures 11.

Western forests are characterized by the predominance of conifers. Hardwoods, where present, are either lightly scattered or mixed with the conifers or they are found only along the streams. Red alder (*Alnus rubra*) is the most abundant hardwood in the Pacific Northwest, although it is also a tree characteristic of the streams in the forests of California. In recent years this tree has come into some importance as a source of lumber for moderate priced furniture. A bul-

letin upon it is therefore timely. Incidentally, Bulletin 1437 gives at once the impression of completeness and thoroughness; there seems to have been little to escape the notice of its three authors, all the way from the silvical characteristics of the tree, its management, and its logging, and the milling, conditioning and remanufacturing of its lumber.

The red alder cut of 1923 was roughly thirteen and one-half million board feet, and while this is only 0.2 per cent of the total cut of hardwood lumber in the United States, it is an important item to the expanding furniture industry of the Northwest which would otherwise have to obtain their supplies from the Mississippi River region or from East-Pacific countries. The aggregate of all hardwoods in the West is large, but only alder occurs in sufficiently large single stands to make utilization profitable. Fortunately, red alder has the technical qualities required for the types of furniture manufactured in the West; and furthermore it is not at all difficult to season either in open piles or in kilns—a decided contrast to the difficulty experienced in drying western oaks, laurel, and madrone, which shortcoming of these woods is often the deciding factor in their utilization.

The merchantable stand of red alder in Oregon and Washington is estimated at about 1,110,000,000 board feet, 750,000,000 of this being in Oregon and the remainder in Washington. The bulletin does not take up alder as it occurs or is used in California.

"Red alder is one of the conspicuous hardwood trees of the Pacific Coast. It grows naturally from southeastern Alaska to southern California, but its commercial range is limited mainly to moist situations in western Oregon and Washington. Throughout the greater part of its range, it occurs as a relatively small-sized tree. Along streams, near springs, in river bottoms, and on well-watered slopes, however, it commonly forms pure stands of commercial-sized timber. On the lower slopes of the coast mountains of Washington and Oregon red alder sometimes grows in practically pure stands over fairly large areas, and takes possession of burned or cut-over lands which have been slow to reforest with conifers."

"Single compact logging units containing 500,000 board feet of merchantable alder, or alder that will produce logs of the size shown in Figure 1, do not seem to be numerous. Units containing 100,000 board feet, however, are of frequent occurrence. Areas extending for several miles along streams will sometimes cut out more than 500,000 feet, but they are exceptional."

Red alder is described as a soft wood of a pale saffron color when fully seasoned, with straight, fine and uniform grain. "If properly cared for, red alder does not warp, check, shrink, or swell appreciably in place. It turns well and takes a fair polish. It also takes glue, paint, and enamel well, and makes an excellent imitation mahogany or walnut when stained."

The bulletin goes on describing in detail the structure, identification, and physical and mechanical properties. The seasoning of the lumber is given considerable space, and while no drying schedule is given, ample data on the present kiln practices are presented. "The seasoning of red alder, even lumber of high moisture content, does not present any special difficulties. Practically the entire cut is kiln dried....." "Green one-inch stock is dried to a moisture content of 12 to 7 per cent in from five to nine days."

Seventy-two per cent of the red alder lumber is used for furniture and 18 per cent for chairs. The remainder is used for novelties and specialties such as woodenware, veneers, brush backs, handles, etc. The furniture and chairs are of a cheap to medium grade variety. The reviewer has seen many such red alder articles in the furniture stores of the San Francisco Bay region where they are often sold unpainted. Practically all the red alder furniture is sold in the Pacific Coast states.

A small quantity of red alder is made into veneers, principally by the rotary process. This veneer is used for drawer bottoms and similar purposes or as cores and cross banding for ply-wood having fancier face woods.

As is usually the case in the utilization of such minor woods as red alder, the logging and milling is characterized by waste and inefficiency. The authors say: "Because of the scattered character of the stand, with consequent small logging units, and uncertainties in demand and price, the logging and milling of alder has been conducted on a small scale, and in the main has not proved a steady or lucrative business. As would be expected under such conditions, the industry is marked by an absence of specialization and high-class management, such as are found in the softwood industry of the region. Operators usually are men of small means. Not infrequently they are relatively inexperienced. Manufacturing equipment is simple and often seemingly inadequate." Logging is conducted on a job-like basis by ranchers and others. Milling is done on small portable mills and the product lacks the finesse of manufacture of larger and more efficiently equipped and operated mills. Utilization in the woods, however, is described as being "fairly close."

Most of the alders cut are from 14 to 22 inches in diameter on the stump, but 10-inch trees are taken and utilization is to a six-inch top diameter.

Red alder already commands a stumpage price comparable to that of its principal associate—Douglas fir. "To be marketable under present market conditions red alder stumpage must be located within a mile or two of transportation facilities, such as a good road, towable water, or railroad; and then it is worth about \$2 per 1,000 feet. Good-sized and well-located stumpage has sold for as high as \$3.50 per 1,000 feet. Small units of scattered stumpage not infrequently sell for as little as 50 cents per 1,000 feet." Camp-run prices of logs in the timber range from \$6 to \$10 per 1,000 feet, and the prices for green alder lumber range from \$28 to \$38 per 1,000 feet in Seattle.

Eight pages are devoted to the characteristics, growth, yield and management of red alder. It is described as a moisture-loving tree, demanding deep, fertile, loamy soil. The climate in the range of its best growth is temperate and humid. It is less tolerant of shade than its broad-leaved associates. Seed production is moderately abundant and readily restocks burns and cut-over areas. Individual trees may attain a height of 120 feet and a diameter of nearly 4 feet when grown in the open, but forest trees are usually under 100 feet in height and 18 inches in diameter. The bole is straight and slender. "Eighty years is an old age for a red alder tree." On properly managed cut-over lands the yield in 50 years should be not less than 15,000 board feet and may reach 40,000 feet. A yield table for ages from 30 to 80 years is given.

"Any prediction of the future of alder timber would have to be based on a number of unknown factors. It is considered a desirable tree to grow, especially for the timber owner who has a tract which he desires to keep permanently forested. As a temporary growth, occupying burned-over lands that are slow to reforest with conifers, and giving way to conifers at maturity, alder is now serving an important purpose and should be encouraged."

The bulletin closes with a volume table, a classified list of uses and directory of producers and consumers of red alder.

E. F.

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NOTES

Forestry by Private Owners Does Pay
Laurentide Company, Limited, Grand'Mere, P. Q. Canada

February 4th, 1927.

Editor:

I have followed with considerable interest the "Conversazione" in the Journal between Reid and Schenck.

Why is the latter so anxious to prevent anyone from taking up commercial forestry, and, after all, what does he know about it? Take his statement—"There is not one *real* forestry stock company anywhere." How about the New Zealand Perpetual Forests Limited? How about this Company, which is planting three and one-half square miles yearly to supply half of its annual requirements in perpetuity? How about the reforestation work actually under way with the St. Regis Paper Company in New York State; by the Brown Company both in Maine and in Quebec; also the beginning of planting by the Spanish River Company in Ontario and the Donnacona Paper Company in Quebec?

Does he suppose that these big business concerns are all deliberately throwing away their money?

Almost all of the pulp and paper companies in Canada are beginning to put their holdings on a sustained yield basis, and they would all do so if they could get proper assurance from the provincial governments that their tenure of licensed lands would be safeguarded at least for one generation.

Finch Pruyn Company of Glens Falls, N. Y., are operating their timber lands for sustained yield. All of these people realize that they must have wood to protect their investment, and they do not need or ask any inducement or subsidy from governments.

How does Schenck know that three per cent money would be any inducement, and why does he choose the rate of three per cent? In our planting operations, we allow five per cent, compound interest, on the money and we expect to make a profit on our investment in planting and properly caring for our lands, and we also expect to save large sums in logging and transportation and storage.

Shepard in his article is pleading for realism in forestry propaganda. I think we have some realism here in Canada. We also have the large forestry enterprises that Schenck speaks of—operations covering from two to fifteen thousand square miles.

I wish Schenck would stop theorizing and make a study of what is really being done. He is hopelessly behind the times.

Yours very truly, ELLWOOD WILSON,
Manager, Forestry Division.

"Fit It With a Stinger"

Editor:

February 3rd, 1927.

Have just finished reading Shepard's "Necessity for Realism in Forestry Propaganda" and wish to congratulate both Mr. Shepard and the Journal. He has hit the nail on the head.

The writer does not agree with him that his plan will be as easy to solve as he has it read, nevertheless he has torn the false veil away from the stagnation that forestry results have been interred in for these many years.

Too much banal talk and sentimental generalities have been indulged in days gone by.

Every member ought to reread his article and then and there decide to do something to make people "Forest Conscious." In that lies the whole solution, not the "Worst First Theory," Infestation, Destructive Logging, Silviculture, Taxation, Management or Protection, but the awakening of the Public by tangible results.

The writer feels that the Executive Council should appoint a committee to attempt to do something along the plan proposed by Mr. Shepard. This committee to be composed not only of foresters but operators, lumbermen and public spirited men who can devise a working plan that will cling to his idea as nearly as practicable. This committee should not be too big to be unwieldy neither should it be composed of members who have stagnated in the past with the old European theories that preach conservation, reforestation and afforestation but in tangible results have accomplished nothing as far as putting a practical working plan across. By all means Mr. Shepard should be on this committee.

The writer is in the operating end of the game, the harvesting of the timber, and Mr. Shepard's article throws the first ray of sunlight into the problem of growing and harvesting timber in unison he has yet read.

More power to you, Shepard, and may you at last wake up the Society and "Fit it with a stinger."

Yours truly, W. J. O'NEIL.
Alvin, Wisconsin
Sever Anderson Logging Co.

Koch is Pleased

Editor:

January 29, 1927.

I just want to express my appreciation for your editorial, "Formulas and Common Sense," in the January number of the "Journal of Forestry." Some of the forest mensurationists are running wild with their fine-haired measurements and mathematical computations, and I am particularly glad to see this brought to their attention by someone whose opinion carries weight.

Very sincerely yours,
ELERS KOCH.

**William Churchill Hodge
1877—1926**

William C. Hodge, known wherever California foresters gathered as "Bill," passed away suddenly on November 26, 1926. He was born in the state of New York on October 4, 1877. After graduating from Phillips Academy and Yale College, he entered the Forest School at Yale, graduating with the first class, that of 1902. He participated in the earliest work of the old Forestry Bureau, working as student assistant from 1899 to 1901, and was appointed Forest Assistant in 1902. In 1909 he resigned from the Service, taking the post of Deputy State Forester of California. He returned to the Service in 1911, continuing until 1916, when he resigned to follow private forestry work. During the past he was engaged on the special study for the Service of the major uses of wood in California.

"Bill" was an eternal seeker after truth, and was never swayed through expediency to any middle course. He was a scholar of unusual attainment and the widest interests. Among California foresters and lumber men he will be remembered for his sense of fairness and the sincerity of his motives. He bitterly opposed irrational and hysterical propaganda, standing squarely for a sound economic solution of our forest policies.

John Foley Promoted

John Foley, who has served as Forester for the Pennsylvania Railroad since February, 1912, has been promoted to Assistant to the Purchasing Agent, in which position he will be in charge of the buying of forest products, and their preservative treatment, wood preservatives, woodenware, and various items of miscellaneous materials. He has been succeeded as Forester by H. R. Condon, who has been Assistant Forester since 1913.

Advertising Rates in the Journal for 1927

	Per 8 issues	Per 1 issue
1 page	\$240.00	\$30.00
$\frac{1}{2}$ page	125.00	18.00
$\frac{1}{4}$ page	75.00	10.00
$\frac{1}{8}$ page	40.00	5.00

Even these rates are still lower than the rates charged by other technical publications of lesser importance and smaller circulation.

SOCIETY AFFAIRS

Report of the Executive Council

In accordance with the practice started in 1924 the Executive Council held a two-day session on December 27 and 28, 1926, just prior to the annual meeting of the Society, with seven of the ten members of the Council present. These meetings are proving invaluable as a means of obtaining far more thorough and satisfactory consideration of Society affairs than is possible by correspondence. The following report gives the conclusions of the Council on the more important matters considered.

CONSOLIDATION WITH OTHER ORGANIZATIONS

The suggestion of several members of the Southwestern Section for a form of consolidation between the Society of American Foresters and the American Forestry Association has been given thorough consideration, as has also a somewhat similar suggestion by a member of the Washington Section, who writes as follows: "As you know, Washington is the headquarters of many learned and scientific societies, most of them without the luxury of paid secretaries. A half dozen of these societies might be amalgamated for the purpose of hiring a high-grade paid secretary to look after their interests. This practice is, I believe, not uncommon among industrial associations. By taking the lead, the Society could make sure of having a forester as executive for such a combination."

The Executive Council is convinced that adoption of either of these suggestions would be detrimental to the best interests of the Society of American Foresters. While it is true that certain objectives of the Society and of the American Forestry Association are the same, there is a radical difference in their fundamental purpose. The American Forestry Association is primarily a popular organization which aims chiefly at the education of the general public and the obtaining of desirable legislation, and which is supported by members who are able to take little personal part in its activities. The Society of American Foresters, on the other hand, is a professional organization, the object of which is to advance the science, practice, and standards of forestry, and to promote coherence and effective cooperation within the profession. The fact that in its efforts to attain these objects it sometimes supports the same measures as the American Forestry Association should not be allowed to obscure the marked differences between the two. Moreover

the Society should formulate its policies and carry out its program of action through the participation of its entire membership.

Any form of consolidation with a popular organization, even if only on the business side, would necessarily detract from the professional character of the Society and make more difficult the attainment of its really distinctive aims. So far as influence is concerned, the Council is inclined to believe that a strictly professional Society, even though small, will have more influence not only in advancing the science and practice of forestry, but in public affairs, if it is entirely independent than if it is intimately connected with a popular organization.

Much the same arguments apply against amalgamation with one or more of the many scientific societies in Washington. These are perhaps more similar in general character, but in every case their objects lie in a different field from those of the Society. One of the things which the Society now most needs is greater unity of purpose and of action. Combination with any other group would tend to prevent rather than to help development of this unity. We shall get farther in the long run by standing on our own feet, even though this may mean passing through a comparatively long period of lean years when desirable activities are necessarily curtailed by lack of funds. Moreover, it should be clearly recognized that the Society itself is in need of a *full time*, not a part time, secretary, so that employment of a man who would devote a portion of his time to some other organization would relieve the present situation little if at all.

On grounds both of fundamental policy and of feasibility the Council finds itself unable to endorse either proposal.

FINANCES

Ballots on increased dues during the past two years have shown approximately 60 per cent of the membership as in favor of \$8 dues for Members and \$12 dues for Senior Members. While this falls short of the 75 per cent necessary for the adoption of a constitutional amendment, it does show a decided majority in favor of a sufficiently increased income to enable the Society to function more effectively.

The Council is willing to concede that it has, perhaps, been too ambitious in asking the members to increase their dues immediately by over 100 per cent. It is, however, not willing to let the matter drop, since it is convinced that the welfare of the Society is dependent upon a more adequate income. It therefore recommends that the incoming Council arrange to continue the discussion and to propose another

amendment to the Constitution raising the dues of Members to \$6 and of Senior Members to \$8. This will mean an increase in present dues of 50 per cent for Members and of 60 per cent for Senior Members. In view of the rather considerable majority in favor of still higher dues, as shown by the last two ballots, the Council believes that there is every reason to anticipate favorable action on this more moderate proposal.

Meanwhile, the Council regards the more effective handling of the Society's activities as of such urgent importance that it recommends the expenditure next year of \$3,000 for the employment of an executive secretary, preferably a forester, and the necessary clerical help incident to his work. It should be emphasized that this amount is inadequate for the purpose and will not permit the employment of the type of man which the Society needs and should have. Until the employment of a full-time clerk is possible, it will be necessary for the executive secretary to devote his efforts largely to the purely routine activities of the Society. In addition, he will do as much as time permits to build up the Society by stimulating section and committee activities and by seeing that these are more fully reported in the Journal. Other constructive work, not of a propagandist character, but in the development of the profession and in the advancement of the science and practice of forestry, can be undertaken only on a very limited scale until larger resources are available.

For the year 1927 the Council recommends approximately the following budget:

EXPENDITURES

Journal of Forestry.....	\$ 6,300
Clerical and secretarial.....	3,000
Miscellaneous printing.....	500
Postage, stationery, etc.....	400
Travel	600
Contributions to other organizations.....	100
Miscellaneous	500
Total	<hr/> \$11,400

RECEIPTS

Annual dues	\$ 5,500
Subscriptions to Journal of Forestry.....	3,000
Sale of back numbers.....	200
Advertising	300

Interest	200
Miscellaneous	100
Reserve fund	2,100
<hr/>	
Total	\$11,400

The only important changes in this budget from that for the present year are in the item for secretarial and clerical service and for travel. The latter has been increased by \$500 in order to give the officers, and more particularly the president and the executive secretary, an opportunity to serve the Society more adequately. The receipts are estimated on the basis of the present membership, present dues, and present subscriptions to the *Journal of Forestry*.

This budget anticipates a deficit of \$2,100, which will be met from the present balance in the treasury. It would be possible for the Society to operate for approximately two years on this basis before this balance, exclusive of the permanent fund of about \$2,500, would be exhausted. Before that point is reached, the Council hopes that the proposed increase in dues to \$6 and \$8 will have been adopted. If so, and assuming that resignations due to increased dues will be approximately offset by new members, this would be sufficient to meet the anticipated deficit and to leave a small balance.

The Council realizes thoroughly that in proposing to dip into the present balance at the rate of approximately \$2,000 a year it is taking a chance. It is, however, so convinced of the need for handling the Society's affairs in a more satisfactory way than is now possible that it believes this to be fully justified. It has faith that when the members fully understand the situation they will be willing to meet it.

In connection with this proposed budget, it should perhaps be emphasized that in spite of the proposed executive secretary the Society must continue to rely very largely not only on the voluntary services of its officers but on much contributed time, and on office space and equipment, from the organizations with which these officers are connected. The Society cannot afford to lean indefinitely upon others for support of this kind which it should be providing for itself.

LEGISLATION

The Council will continue the policy which it has followed during the past few years of speaking for the Society in matters of policy and legislation, except when these are of a controversial nature and the

sentiment of the members generally is in doubt. In such cases the Council will, when circumstances permit, attempt to determine the views of the Society as a whole before taking action.

At this time the Council urges the passage of the McNary-Woodruff Bill providing for an increased program of acquisition of forest lands by the Federal government, and the increased appropriation for co-operative fire control activities approved by the Bureau of the Budget under Sections 1, 2, and 3 of the Clarke-McNary Act. It expresses hearty appreciation of the thorough-going and constructive report of the special committee of the Washington Section entitled "A National Program of Forest Research," and endorses the conclusions and recommendations contained therein, including the proposed organic act providing for a comprehensive program of forest research in the U. S. Department of Agriculture.

The Council also endorses in principle the National Arboretum Bill, the Migratory Bird Refuge Bill, and the Newton Bill providing for a survey of the water resources of the United States; and urges the appropriation of adequate funds to carry out the provisions of the Temple Act for the completion of a topographic survey of the United States within the next twenty years. In connection with bills of this character the Council calls attention to the desirability of co-operation in matters of common interest with other organizations interested in the conservation of natural resources.

With regard to proposed legislation dealing with grazing on the National Forests and the Public Domain, the situation has changed considerably during the past year. There now seems to be no danger of the passage of the original Stanfield Bill, to which such vigorous exception was taken by the Council and by the last annual meeting. A new bill has been prepared by the Forest Service, in consultation with representatives of the Senate Committee on Public Lands, which has been introduced in the House by Mr. Haugen and in the Senate by Senator Stanfield. Still another bill, which approaches the problem from a somewhat different angle and was prepared by Mr. P. P. Wells, has been introduced in the Senate by Senator Norris.

There seems to be little prospect that any grazing legislation will be passed at the present short session of Congress. On the other hand, the entire question is still very much alive. The Secretary of Agriculture and the Forester both desire the passage of legislation along the lines of the present administration bill, and legislation on the subject was also recommended by the President in his annual message to Con-

gress. Under these circumstances the Council believes it important for the Society to be prepared to take a definite stand on a matter which so vitally affects the welfare of the National Forests.

The Council itself stands firm on its already expressed opinion that there should be no legislation which will interfere with the present authority of the Secretary of Agriculture to exercise complete control over grazing and other secondary uses of the National Forests. It believes further that it is unwise to enact into law most of the details included in the present administration bill, and is in doubt as to the wisdom of any legislation on the subject. On the other hand, it recognizes that these are matters on which there may well be much honest difference of opinion.

To meet this situation, it believes that the membership of the Society should be more thoroughly informed as to the pros and cons of the various proposals, and thus be in a better position to voice an intelligent opinion. It has, therefore, decided to ask the editor of the *Journal of Forestry* to devote an early issue of the *Journal* to a presentation of the grazing problem from all sides. It is hoped that this presentation will lead to a discussion in the various sections and in the *Journal of Forestry* which may well be continued as long as interest in the subject warrants. Before the end of the year a letter ballot to determine the sentiment of the membership as a whole on the more important points involved may prove advisable.

SURVEY OF PRIVATE FORESTRY

The Council believes that a good start has been made during the past year on the survey of private forest practice.¹ It regards this as a valuable project both from the standpoint of the information obtained and as a means of stimulating activity on the part of individual members. It therefore urges that it be made a continuing project with the aim of assembling and keeping up-to-date a body of data relating to the practice of forestry by private owners which will be as complete and authoritative as possible.

Protests have been received from two Section secretaries to the effect that such projects as this should be handled directly by the parent Society rather than by the Sections. The Council is inclined to dissent from this view on the ground that conditions vary so widely in different parts of the country that a project of this kind can be organized and handled much more effectively by the individual Sections. It further

¹ A report summarizing the results to date is printed elsewhere in this issue of the *Journal*.

believes that the encouragement of sectional activity on matters not only of regional but of national importance is a desirable policy which will strengthen the Sections themselves and at the same time make for a more unified Society. Active participation of individual members in obtaining the desired data, which is one of the objects of the study, can also be assured more fully through the Sections than by notices in the Journal or by circular letters from the secretary of the Society.

On the other hand, the Council is in full agreement that where any project requires the general distribution of mimeographed or printed material this should be provided by the parent Society. Further consideration will be given to the advisability of using uniform questionnaires in connection with the survey of private forestry. If it is decided to adopt these an adequate supply will be furnished to the section secretaries, whose continued cooperation in the handling of the project can, it is hoped, be definitely counted on.

JOURNAL OF FORESTRY

Several members of the Society have recommended that additional funds be provided for improving the quality of the Journal of Forestry. Others have suggested reducing its allotment in order to make additional funds available for secretarial assistance. The Council believes that any reduction in the present standard of the Journal, representing as it does the chief present activity and means of expression of the Society, would be most unfortunate. On the other hand, in view of the urgent need of further secretarial and clerical service, it does not believe that any increase in its present allotment is justifiable. The proposed budget for 1927, therefore, carries the same amount for the Journal that it has had during the two preceding years.

In this connection, the Council wishes to commend the Editor-in-Chief of the Journal and the other members of the Editorial Board for the excellent quality and appearance of the Journal during the past year. It commends especially the new policy of starting each issue with a short editorial on some outstanding current event in forestry. It urges that this policy be continued, and that a vigorous effort be made to cover Society affairs more adequately, including more complete reports and current news from the various sections and committees. Early publication of a new list of members, with reprints, is recommended.

Recognition is also due of the Editorial Board's economy in publishing the Journal. Had it not been for this, the Society would have

ended the year with a deficit of several hundred dollars, in spite of the large voluntary contributions from its own members and others.

REVISION OF CONSTITUTION

For some time the Executive Council has felt that revision of the present constitution is much needed on a number of important points. Suggestions to this end have been made by a committee consisting of E. H. Frothingham, chairman, C. R. Tillotson, and Emanuel Fritz, to whom the Council expresses its appreciation for their exceptionally painstaking and effective work.

The modifications which have been proposed by the committee and tentatively approved by the Council are of such importance that they should be thoroughly discussed by the membership at large before being submitted for final action. Arrangements are therefore being made for their publication in an early issue of the Journal, with notes as to the reasons for the changes suggested. After there has been ample opportunity for study and discussion, final decision as to the changes to be recommended will be reached by the Council and the proposed amendments submitted to the entire membership for letter ballot. Following the adoption of the revised constitution the Council favors incorporation of the Society.

MISCELLANEOUS

The Allegheny Section at its last summer meeting expressed the belief that a standard rule for measuring the contents of saw logs is of national importance, and suggested that the Executive Council take suitable action to have the Secretary of Commerce include the standardization of log rules in the standardization projects sponsored by the Department of Commerce. The Council felt that it does not have sufficient information to justify it in taking final action on this recommendation at this time, and decided to refer the matter to the Committee on Utilization of Forest Products for further consideration and recommendation. It also voted to refer the matter of Section boundaries to the Committee on Sections for further study and recommendation.

The Council desires to express its appreciation of the generosity of Mr. Charles Lathrop Pack in providing for the Charles Lathrop Pack Prize, in enabling the Society to send a representative to the World Forestry Congress at Rome last spring, and in making possible publication of the report by a committee of the Washington Section entitled "A National Program of Forest Research." These are all con-

structive activities which could not have been financed from the Society's regular income.

The Council urges acceptance of the invitation from the California Section to hold the next annual meeting of the Society in California. It believes that a western meeting will contribute much to the welfare of the Society and is confident that a large and enthusiastic meeting will be held under the auspices of the California Section.

R. C. BRYANT,
G. H. COLLINGWOOD,
S. T. DANA,
S. B. DETWILER,
J. G. PETERS,
P. G. REDINGTON,
R. Y. STUART.

Report of the Treasurer for the Year 1926

The Society this year carried on an unusual amount of constructive activity in developing its program. Expenditures for development totalled \$1,715.75, or about 20 per cent of the Society's regular income. For this purpose, only \$164.25 (or less than 2 per cent of the regular income) was expended from the current fund. No money was withdrawn from the emergency fund and the permanent fund was increased by \$170. The solution of this apparent miracle is that sixty-two loyal friends of the forestry profession cooperated very generously with the Society by contributing \$1,551.50. For each dollar contributed by the Society from its regular income for its development work, about nine and one-half dollars were contributed for such work by those who believe it is the Society's task to do more than routine.

The routine work of the Society, such as publication and mailing of the Journal, revising mailing lists, collecting dues, accounting, etc., necessitated expenditure of over 95 per cent of the regular income for the year. By regular income is meant the amounts which can be depended upon as a fixed source of revenue, such as dues, subscriptions to Journal, and advertising. It does not include contributions.

It was estimated at the beginning of the year that the routine expenses would exceed the regular income by \$1,052. However, the Editorial Board saved \$317 on its very moderate budget allowance for the Journal. Rigid economy effected similar savings all along the line. For instance, the value of stenographic service necessary to con-

duct Society affairs amounted to many times the sum of \$47.33 paid for this item.

Instead of the estimated deficit, we now find that the balance in the current fund on December 31, 1926, less accounts payable, is \$32.82 greater than the balance of current funds on December 31, 1925. Since \$170 was transferred to the permanent fund, the Society is actually \$202.82 wealthier than last year. Had not increase in membership and subscriptions to the Journal increased our income for the year by about \$705 over 1925, it would have been absolutely impossible to balance our budget.

Routine work must be done to keep the Society functioning. But to advance the science, the practice, and the standards of forestry under the Society's program requires increased effort and new activities. I am authorized to express the grateful appreciation of the Executive Council to those who have faith in the program and have contributed so generously to its development. The list of contributors is as follows:

J. H. Allison
S. Duval Anderson
Douglas Basnett
C. Edw. Behre
Richard L. P. Bigelow
J. H. Billingslea
Nelson C. Brown
Nathan D. Canterbury
H. H. Chapman
Bertram E. Claridge
A. C. Cline
P. T. Coolidge
Joshua A. Cope
S. T. Dana
Ralph K. Day
S. B. Detwiler
Lynn H. Douglas
Howard R. Flint
J. H. Foster
F. G. Gaylord
James L. Goodwin
Henry S. Graves
W. B. Greeley

John D. Guthrie
Paul B. Haines
R. C. Hall
Crosby A. Hoar
H. Harrison Hoyt
Francis Kiefer
Joseph Kittredge, Jr.
Arthur Kochler
Clyde Leavitt
W. G. Lowdermilk
N. F. Macduff
L. J. Markwardt
Roy L. Marston
F. G. Miller
Barrington Moore
Thornton T. Munger
Louis J. Murphy
L. A. Nix
Charles Lathrop Pack
Benson H. Paul
Gifford Pinchot
O. M. Porter
Albert F. Potter

Jay H. Price
 Raymond E. Rendall
 Edward Richards
 Jacob Roeser, Jr.
 H. G. Schanche
 Henry Schmitz
 F. X. Schumacher
 Kan Smith

Thos. C. Spaulding
 Carl M. Stevens
 J. Warrington Stokes
 A. E. Wackerman
 H. Basil Wales
 Elwood Wilson
 I. T. Worthley
 Raphael Zon

Grateful acknowledgment is also made to B. A. Chandler, R. G. Pierce, A. E. Fivaz and F. E. Staebner, who contributed many hours of valuable services to the Society in connection with its fiscal affairs.

RECEIPTS

Cash on hand, Washington Loan and Trust Co., Jan. 1, 1926.....	\$ 3,885.06	
Annual dues		
1922	\$ 8.00	
1925	152.50	
1926	4,945.89	
1927	42.50	
		5,148.89
Suscriptions to Journal of Forestry		
Vol. XXIII = 1925.....	\$ 3.50	
Vol. XXIV = 1926.....	2,633.84	
Vol. XXV = 1927.....	472.50	
		3,109.84
Sale of back numbers		
Journal of Forestry.....	\$ 254.93	
Proceedings of the Society of American Foresters.....	20.80	
Forestry Quarterly	4.00	
List of members .....	.25	
		279.98
Advertising		
Commercial	\$ 214.00	
Educational Institutions	160.00	
		374.00
Contributions		
From members of Society		
To current funds.....	\$1,439.00	
To permanent fund	112.50	
		1,551.50
Interest		
On bonds.....	\$ 42.50	
On deposits with Washington		
Loan & Trust Co.	173.26	
On 6½ real estate note in		
permanent fund	65.00	
		280.76

Refund	89.51
Miscellaneous	82.60
Total	14,802.14

DISBURSEMENTS

JANUARY 1 TO DECEMBER 31, 1926

Printing and distributing Journal of Forestry	
Vol. 23, No. 12 (December, 1925).....	\$ 493.32
Vol. 24, No. 1-7 (Jan.-Nov., 1926, inc.)	5,230.95
Miscellaneous printing	352.15
Stationery and postage (exclusive of Journal)	209.95
Clerical, addressograph and stenographic work	39.58
Telegrams, express, etc.	42.98
Executive secretary	
Salary and clerical assistance, 1926	\$1,658.10
Balance on salary, 1925	132.73
	1,790.83
Chas. L. Pack Prize	
Administration of prize.....	\$ 45.29
Award of prize	500.00
	545.29
Miscellaneous	
Contributions to American Forest	
Week Committee	\$ 50.00
Contribution to National Conference on	
Outdoor Recreation	50.00
Travel	34.30
Expenses of Society representative	
to Rome Forest Conference	750.00
Contribution to Schlich Memorial Fund	100.00
Other	186.16
	1,170.46
Petty cash	79.00
Transfer to Permanent Fund, Equitable	
Cooperative Building Association	170.00
Cash on deposit, Washington	
Loan & Trust Co., December 31, 1926.....	\$5,290.13
Less outstanding checks	612.50
	4,677.63
Total	\$14,802.14

ASSETS

Cash on hand, Washington Loan & Trust Co.,	
December 31, 1926	\$5,290.13
Less outstanding checks	612.50
	\$ 4,677.63
Accounts receivable;	
Annual dues, 1926.....	\$ 197.00
Sale of back numbers of Journal, etc.	8.45
Advertising	3.00
	208.45

U. S. Treasury 4¼ Gold Bond of 1932-47	500.00
Five \$100 U. S. Treasury 4¼ Bonds of 1947-52	500.00
Interest accrued on foregoing bonds.....	5.30
Journals, etc., in stock:	
Journal of Forestry, 6,748 copies @ 35c.....	\$2,379.30
Forestry Quarterly, 4,697 copies @ 35c.....	1,643.95
Proceedings, 2,477 copies @ 35c	866.95
	<hr/>
	4,890.20
Addressograph machine (estimated value)	25.00
Addressograph stencils	55.00
Permanent fund:	
First mortgage 6½ real estate note	
due June 3, 1928.....	\$1,000.00
Interest on foregoing at present	
deposited in Washington Loan & Trust Co.....	65.00
Interest on foregoing accrued	4.87
Deposit in Equitable Cooperative	
Building Association	1,623.50
Interest accrued on foregoing deposit.....	63.56
	<hr/>
	2,756.93
Total	<hr/> \$13,618.51

LIABILITIES

Annual dues paid in advance, 1927.....	\$ 42.50
Subscriptions to Journal in advance	472.50
Accounts payable:	
Printing and mailing December, 1926,	
Journal	\$ 752.00
Clerical work	7.75
	<hr/>
	759.75
Profit and loss surplus	12,343.76
Total	<hr/> 13,618.51

Audited and found correct, January 13, 1927.

(Signed) B. A. CHANDLER,

(Signed) ROY G. PIERCE.

Respectfully submitted,

S. B. DETWILER, *Treasurer.*

Committee on International Relations in Forestry

The year 1926 has witnessed a marked development in the establishment of closer relations between foresters in America and in other parts of the world. Foremost in bringing this about have been the World Forestry Congress at Rome, April 29 to May 5, and the International Congress of Plant Sciences at Ithaca, N. Y., August 16 to 23. Both of these gatherings have already been reported on in the Journal of Forestry.

The World Forestry Congress, with some 700 delegates from about 60 different countries, afforded an exceptionally good opportunity for the establishment of outside contacts. The Congress was attended by 16 representatives of the Society of American Foresters, most of whom later visited other parts of Europe. Their reception was everywhere cordial and indicated a growing interest on the part of our European brethren in the activities of American foresters.

During the year Dr. von Monroy, forester from the Forest Academy at Eberswalde, and Dr. Prell, forest zoologist from the Forest Academy at Tharandt, have been studying in the United States under the auspices of the International Education Board. We have also been favored with a visit from Professor Jonson of the Swedish Forest School, who traveled widely and established many helpful contacts. He brought with him the first draft of a Swedish-English and English-Swedish forest dictionary which it is hoped may be published co-operatively by the Society of American Foresters and the Swedish Forestry Society. Much interest in international forest dictionaries has been expressed in other countries, and here and there some progress is being made toward their preparation.

Professor Hesselman, director of the Swedish Forest Experiment Station, plans to attend the International Congress of Soil Science at Washington next spring, and it is hoped that arrangements may be made for him to spend several months working with investigators at the forest experiment stations and forest schools in studies of forest soils. It is also hoped that arrangements may be made to have a section on forest soils, or at least a day or two devoted to that subject, at the International Congress of Soil Science. Negotiations to this end are now under way.

The survey of forest research and forest education under way by the National Academy of Sciences is being handled by a committee consisting of Dean H. S. Graves of the Yale School of Forestry, Professor I. W. Bailey of the Bussey Institution, and Dr. H. A. Spohr of the Carmel, California, Laboratory of the Carnegie Institution. Professor Bailey has spent some time traveling in this country in order to get in touch with the forest schools, forest experiment stations, and various other forest research agencies, and all three men have visited Europe during the year. Pending recommendations from this committee, the International Education Board apparently intends to go slowly in undertaking any forestry projects. It may, however, consider a comparatively few applications for fellowships, particularly from

younger men of promise either in this country or elsewhere who desire to prepare themselves more adequately for their work. In this connection, mention should be made of the fact that the John Simon Guggenheim Memorial Foundation will be glad to consider fellowships for study in forestry on a par with applications for study in other fields, and is, in fact, anxious to get in touch with men who give unusual promise of productive scholarship.

At the request of the Tropical Plant Research Foundation for co-operation on the part of the Society, a sub-committee on tropical forestry has been organized, consisting of the following members: W. N. Sparhawk, Chairman; H. M. Curran, A. F. Fischer, A. Leopold, S. J. Record. The same plan of organization is being followed as with the committee on education, under which the chairmen of the various sub-committees are members of the main committee, while the other members of the sub-committees are not. The sub-committee on tropical forestry has cooperated with the Tropical Plant Research Foundation by furnishing information and advice, and will doubtless become increasingly active as the forestry work of the Foundation expands.

As to specific projects, a comprehensive plan for the collection of international forest statistics by the International Institute of Agriculture was approved by the World Forestry Congress. Although this was generally regarded as the most important action taken by the Congress, some doubt exists as to how actively the project will be pushed by the International Institute of Agriculture. Subsequent to the Congress the president of the Institute, in announcing a donation of 50,000 liras a year for a period of five years from the Italian government for the establishment of a special Bureau of Forestry in the Institute, stated that the matter of forest statistics would be left aside for the present and particular attention devoted to the problems of wind control and fire control. If it becomes clear that satisfactory statistics can not be obtained through the Institute, careful consideration must be given to some other method of handling the project.

The first draft of schedules for the world census of agriculture covered practically all of the items relating to forests and forest products which had been suggested by this committee. Conferences with statisticians in this and other countries, however, resulted in the elimination of most of these as being not germane to the census, or as impossible to secure with sufficient accuracy to be of real value. By the time the World Forestry Congress met, the only item left dealing with forests was one providing for information as to the area of forest land on

farms. The Congress recommended inclusion of another item giving the amount of wood cut on farms. While it is disappointing that more information concerning forest resources and forest utilization can not be obtained in connection with this project, the desire to keep the first world census as simple as possible rendered this out of the question.

The question of forest bibliographies has been a live one throughout the year. A meeting of the Bibliographic Commission of the International Union of Forest Experiment Stations was held at Zürich, April 23-24, 1926, at which this society was represented by Professor Mulford. At the Zürich meeting a tentative classification of forest literature was adopted and arrangements made for continued activity on the part of a reorganized and enlarged commission under the chairmanship of Professor Hesselman of the International Union of Forest Experiment Stations. Some discussion of the reorganization both of the Union and of the Bibliographic Commission had been anticipated at the World Forestry Congress, but for various reasons it was later decided not to raise these questions at that time.

They were, however, discussed at considerable length in the Forestry Section of the International Congress of Plant Sciences. That section expressed keen interest in the International Union of Forest Experiment Stations, which is planning to hold its next meeting in Sweden in 1929, and also in the preparation of an international forest bibliography. Much difference of opinion existed as to the desirability of a detailed classification such as that proposed at Zürich, but the meeting was unanimously in favor of the issuance of cards for all current forest literature, including periodical articles, preferably by the International Union of Forest Experiment Stations. As to procedure, the meeting recommended the appointment in each country having a forestry organization of a committee to secure the views of foresters and librarians in that country as to the plan which should be used in issuing these cards. It also recommended that the chairmen of these various national committees together form an international committee for the formulation of conclusions to be presented at the next meeting of the Union. It was felt that this large international committee should have a small executive committee which would correlate the suggestions received and make definite plans in regard to the organization of the work, particularly with respect to finances.

The meeting was very strongly of the opinion that the International Union of Forest Experiment Stations itself should be revived and strengthened. It felt that the International Institute of Agriculture

might well handle such projects as the collection of international forest statistics and other matters involving official relations with the governments of the world, but that there should be an independent international organization such as the Union of Forest Experiment Stations for the consideration of scientific questions. The suggestion made in certain quarters following the World Forestry Congress that an attempt be made to create an international institute of forestry similar to but independent of the International Institute of Agriculture did not appear to meet with much favor. The consensus of opinion was that the time is not ripe for the creation of such an institute and that it is preferable at this time to strengthen the International Institute of Agriculture and the International Union of Forest Experiment Stations. Should it later become clear that satisfactory service can not be secured from the Institute in forestry matters, the question of a separate institute can then be considered.

This committee is in accord with these conclusions. We believe that full use should be made of existing agencies interested in forestry, such as the International Union of Forest Experiment Stations, International Institute of Agriculture, International Congress of Plant Sciences, International Congress of Soil Science, and Tropical Plant Research Foundation, and that the Society of American Foresters should cooperate heartily with these. We are particularly hopeful of good results from the International Union of Forest Experiment Stations, which is a strictly technical forestry organization with excellent opportunity for developing more cordial relations and more effective cooperation among foresters, and especially among forest investigators.

We are also keenly interested in more travel by foresters outside of their own country, such as the visits during the past year of American foresters to Europe and of European foresters to America. There is no more effective way of broadening the outlook of the profession, obtaining concrete information as to what is going on elsewhere, and establishing the close personal relations which are so important a factor in the development of better international understanding. We therefore hope that the present survey of forest education and forest research being made by the National Academy of Sciences with the support of the International Education Board will result, among other things, in a much freer interchange of forest workers between different countries.

S. T. DANA, <i>Chairman</i> ,	R. S. KELLOGG,
R. C. BRYANT,	W. N. SPARHAWK,
R. S. HOSMER,	RAPHAEL ZON.

Report of Forestry Classification Committee

The forestry classification scheme prepared by the Society's committee¹ has been incorporated in the Extension Handbook now being published by the Extension Service of the United States Department of Agriculture. Although its publication has been delayed it is expected from the press within a month.

The editor of the Dewey Decimal Classification requested permission to use the Society Committee's scheme in the preparation of the 12th edition of the Dewey Classification. The request was freely granted and the Dewey Tables are now in press.

The most significant development of the year in forestry classification matters has been the outstanding interest which has developed abroad concerning an international forestry bibliography.

Last year Dr. Philip Flury prepared a tentative classification scheme, based largely upon the one in use at the Swiss Forest Research Institute. Dr. Flury proposed that his scheme be used as the starting point in developing an international bibliography of forestry. The committee is very grateful to Mrs. John M. Briscoe for her excellent translation of this scheme, which appeared originally in French and German.

While Dr. Flury's scheme was under study a pressing invitation to attend a meeting of the International Bibliographic Commission in Zurich, April 23-24, 1926, was received from Dr. A. Oppermann, Chairman of the Commission. Although it was impossible for any of the members of the Society Committee to attend this conference, we were fortunate in being represented by Professor Walter Mulford of the University of California. Professor Mulford reports that, after briefly considering the background of the conference, much time was devoted to an attempt to adopt a classification of forestry to serve as the basis of a bibliography. The discussion centered on two proposed schemes submitted in printed form by Dr. Oppermann and Dr. Flury, but no decisions were made. From the proceedings of this meeting it appears that the foundations of an international forestry bibliography were laid at the fourth meeting of the International Union of Forest Experiment Stations held at Vienna in 1903. At this meeting a Bibliographic Commission was formed, consisting of Dr. Bühler of Tübingen as Chairman, Dr. Oppermann of Copenhagen, Forest Inspector Crahay of Brussels, Adjunct Böhmerle of Mariabrunn, and Dr. Flury of Zurich.

¹ Journal of Forestry 21: 148-161, 1923.

At the fifth meeting at Stuttgart in 1906 and the sixth meeting at Brussels in 1910 the question of a bibliography received further consideration. The Commission was then enlarged to seven members through the appointment of Dr. Hesselman of Stockholm and Dr. Beck of Tharandt. The final decision regarding the bibliographic undertaking should have been made at the seventh meeting which was to have been held in September, 1914, in Hungary, but which was postponed because of the outbreak of the World War.

Following the death of Dr. Bühler in 1920, Dr. Oppermann, Director of the Danish Forest Experiment Station, was appointed to the chairmanship of the Commission.

The Forestry Section of the International Congress of Plant Sciences had the question of an international forestry bibliography on its agenda for the Ithaca, N. Y., meeting, August 16-23, 1926, one session being devoted to a symposium on this topic. The various European attempts at forestry classification were reviewed. Other schemes were mentioned as follows: the Yale School of Forestry system published in 1902, those subsequently published in the *Journal of Forestry* by S. B. Detwiler, C. F. Korstian, and a Committee of the Society of American Foresters, and another system for filing information on forestry proposed by S. H. Howard of British India at the International Forestry Congress at Rome last May.²

The question of an international forestry bibliography was placed on the agenda of the International Congress of Plant Sciences mainly for the purpose of obtaining a discussion of its international aspects. The following questions were considered: the desirability of a universal forestry bibliography to be used as the basis for issuing index cards and for the classification of forestry literature generally, the agency and machinery by which such bibliography can be prepared, and what organization should assume responsibility for this work and how it should be financed. After a lengthy discussion the following resolution was adopted:

Resolved: That it is the sense of the Forestry Section of the International Congress of Plant Sciences that it is in favor of seeing an International Forest Bibliographic Commission organized, and that those nations having a forestry organization be invited to establish a national forestry commission, the chairman of which shall be a member of the International Forest Bibliographic Commission; that the Inter-

² To be published in the Proceedings of the Forestry Congress.

national Forest Bibliographic Commission have an executive committee of five (5) members, the duty of which shall be to decide what organization shall issue a bibliography and to devise means for carrying on the work.

The Society's Committee urgently recommends that the above or a similar resolution be endorsed by the Society or its Council at the 1926 annual meeting and that the present Committee be discharged.

Because of the distinct international aspects recently assumed by the forestry bibliography work and in order to insure the closest co-operation in international affairs, it is recommended that the subsequent negotiations pertaining to the development of an international forestry bibliography be assumed either by the Committee on International Relations or by a newly formed sub-committee of this committee, as may appear desirable.

C. F. KORSTIAN, *Chairman*,

(Signed) A. B. RECKNAGEL,

(Signed) JOHN M. BRISCOE,

Forestry Classification Committee.

Report On Admissions

ELECTIONS DURING THE YEAR 1926

The membership was increased through elections in 1926 by a net total of 140—136 members, 2 Senior Members (in addition to 17 Seniors advanced from the Member grade), 1 Associate Member, and 1 Corresponding Member. This net total compares with those for the previous four years as follows: 142 in 1925; 124 in 1924; 224 in 1923; and 48 in 1922.

Elections in 1926 were from two lists of candidates issued November 12, 1925, and May 1, 1926, respectively. The former contained 78 candidates—67 for Membership, 10 for Senior Membership, and 1 for Associate Membership. Of these, 65 were elected Members, 10 Senior Members, and 1 Associate Member, effective April 5, 1926. The list of May 1, 1926, contained 101 candidates—79 for Membership, 21 for Senior Membership and 1 for Corresponding Membership. Of these 71 were elected Members, 9 Senior Members, and 1 Corresponding Member, effective October 1, 1926. The nominations and elections from these two lists may be summarized as follows:

	Member	Senior Member	Associate Member	Corresponding Member	Total
Nominated	146	31	1	1	179
Elected	136	19	1	1	157
Pending	10	12	-	-	22

Of the 31 nominations for Senior Member, 27 were for advancement from the Member grade and 4 were for direct election as Senior. Of the 27 for advancement, 17 were elected; and of the 4 initial nominations, 2 were elected, both having been former members of the Society who had been dropped for non-payment of dues.

Action is still pending in the case of 22 candidates: 2 in the Member class from the list of November 12, 1925, and 8 in the Member class and 12 in the Senior Member class from the list of May 1, 1926.

The most recent list, that of November 20, 1926, upon which action is yet to be taken, contains the names of 63 candidates for Membership, 4 for Senior Membership, and 1 for Associate Membership.

There were no nominations during 1926 for the grade of Fellow.

LIST OF ELECTIONS, 1926

MEMBER

- Altpeter, L. Stanford, Northeastern Forest Experiment Station, Amherst, Mass.
 Averell, James L., Stiftelsen Sverige Amerika, Regensgaten 29, Stockholm, Sweden.
 Bachman, Earl E., Forest Service, Susanville, Calif.
 Baldwin, Henry Ives, c/o Brown & Co., Berlin, N. H.
 Bateman, Ernest, Nakoma, Madison, Wis.
 Baumann, Herman, c/o Fruit Growers Supply Co., Susanville, Calif.
 Bellue, Alfred J., Forestry Dept., Del Monte Properties Co., Pacific Grove, Calif.
 Benedict, W. V., 618 Realty Bldg., Spokane, Wash.
 Blair, George Dewey, Consumer's Power Co., Jackson, Mich.
 Booth, Irwin S., Dept. of Conservation, Lansing, Mich.
 Bruckhart, J. R., Forest Service, Darrington, Wash.
 Byrne, John B., Box 1059, Columbus, Ga.
 Carter, Thos. R., Estacada, Oregon.
 Chamberlin, Robert W., Rocky Ford, Colo.
 Clapp, T. A., c/o Lolo National Forest, Missoula, Mont.
 Clark, Donald E., Forest Service, Laramie, Wyo.
 Clifford, Edward Davis, 221 W. Rankin St., Flint, Mich.
 Cobb, Francis E., State Forester, Bottineau, N. D.
 Colley, Reginald H., 1712 Madison St., Madison, Wis.
 Colvill, Leslie L., Forest Service, Bend, Oregon.
 Connor, Solon D., 904 Washington Ave., Portland, Me.
 Cook, David B., 12 McPherson Terrace, Albany, N. Y.
 Cook, Lawrence F., Three Rivers, Calif.
 Curry, John R., 1411 Fidelity Bldg., Baltimore, Md.
 Davis, Albert T., Stop 28, Schenectady Rd., West Albany, N. Y.
 Davis, James E., 214 Thurston Ave., Ithaca, N. Y.
 Dayharsh, Victor J., Forest Service, Glenwood Springs, Colo.
 Dayton, Wm. A., Livingston Heights, R. D. 1, Rosslyn, Va.
 DeCamp, John C., Michigan State College, East Lansing, Mich.
 Den Uyl, Daniel, District Forester, Jefferson City, Mo.
 Derby, Wm. F., Forest Service, Willows, Calif.
 Dunlap, Matthew E., Route 6, Nakoma, Madison, Wis.
 Durbin, M. H., Gardiner, Oregon.
 Fay, Wm. B., Forest Service, Deadwood, S. D.
 Fields, Ralph E., Forest Service, Missoula, Mont.

- Flory, Chas. H., 14-A King St., New Bern, N. C.
 Follweiler, Alfred D., Dept. of Conservation and Development, Trenton, N. J.
 Frank, Bernard, Forestry Dept., Cornell University, Ithaca, N. Y.
 Fuechsel, Charles F., 1438 Walnut St., Philadelphia, Pa.
 Geltz, Chas. G., 305 Hilgard Hall, University of California, Berkeley, Calif.
 Gemmer, Eugene W., 179 Cleveland Ave., Buffalo, N. Y.
 Gerrard, Paul H., Orofino, Idaho.
 Gibbs, Joseph A., c/o Caspar Lumber Co., Caspar, Calif.
 Gillett, Charles Alton, State Extension Forester, Bottineau, N. D.
 Gooding, Leslie N., Dept. of Plant Pathology, Oregon Agricultural College, Corvallis, Oregon.
 Graham, Clifford L., Woodsville, N. H.
 Grossman, Herman J. A., 815 E. Burnside St., Portland, Oregon.
 Haefner, Henry E., Westfir, Oregon.
 Hall, Ralph C., Harvard Forest, Petersham, Mass.
 Hamilton, Neal R., Forest Service, Deadwood, S. D.
 Hanson, Percy D., 1918 Napa St., Berkeley, Calif.
 Harlow, Wm. M., New York State College of Forestry, Syracuse, N. Y.
 Haynes, Geo. S., Forest Service, Coeur d'Alene, Idaho.
 Herr, Clarence S., c/o Farm Bureau, Milford, N. H.
 Horner, J. T., c/o Forest Service, Whitebird, Idaho.
 Hough, Ashel F., 1332 Farragut St., Washington, D. C.
 Hyland, Fay, 403 Ann St., East Lansing, Mich.
 Jack, Harvey C., Forest Service, Coeur d'Alene, Idaho.
 Jackson, Jr., W. E., R. F. D. No. 8, Lexington, Ky.
 Joy, C. A., Lyon, Mont.
 Johnson, Chas. H., Chamber of Commerce Bldg., Missoula, Mont.
 Johnson, Ralph H., East Tawas, Mich.
 Kevin, Paul R., Forest Service, Sonora, Calif.
 Knowles, H. Henry, Northfield, Vt.
 Koroleff, A. M., Forest Service, Portland, Oregon.
 Kribs, David A., 2195 Doswell Ave., St. Paul, Minn.
 Leffelman, L. J., Forestry Dept., Ohio Agricultural Experiment Station, Wooster, Ohio.
 Long, James S., Forest Service, Russellville, Ark.
 Luxford, Ronald F., 1606 Hoyt St., Madison, Wis.
 MacAloney, Harvey J., Northeastern Forest Experiment Station, Amherst, Mass.
 MacKinney, A. L., 105 Mansfield St., New Haven, Conn.
 Mace, B. H., Forest Service, Weaverville, Calif.
 Mack, Charles B., Forest Service, Salida, Colo.
 Madlinger, George J., University of the South, Sewance, Tenn.
 Marsh, John T., Forest Service, Basin, Mont.
 Mason, Ira J., Forest Service, Darrington, Wash.
 Matthews, Donald N., 112 Ramona Court, Roseburg, Oregon.
 McCormick, W. C., Dept. Conservation and Development, Division of Forestry, Raleigh, N. C.
 McNair, John W., Forest Service, Asheville, N. C.
 Melis, Percy E., 618 Realty Bldg., Spokane, Wash.
 Merrill, M. C., Humboldt Redwood Reforestation Assn., Samoa, Calif.
 Mielke, James L., c/o Forest Pathology, P. O. Box 4137, Portland, Ore.
 Miller, Allan F., Forest Service, Leadville, Colo.
 Miller, Theodore R., 212 W. Garrison Ave., Dearborn, Mich.
 Mitchell, Homer C., A. & M. College, Miss.
 Moir, Arthur D., Choteau, Mont.
 Moncrief, E. S., Greenwood, La.
 Moody, V. C., c/o Forest Service, Coeur d'Alene, Idaho.
 Nelson, DeWitt, Forest Service, Nevada City, Calif.
 Newcomb, Paul S., DuNoir, Wyo.
 Palmer, Linus C., Road Commission Bldg., 1500 Scribner Ave., N. W., Grand Rapids, Mich.

- Pearce, J. Kenneth, Acting Chief Forest Engineer, Chepants, Madras, S. India.
 Price, Wm. S., Forest Service, Sonora, Calif.
 Putnam, Henry N., 618 Realty Bldg., Spokane, Wash.
 Renshaw, E. W., Box 274, Moscow, Idaho.
 Robb, Wm. L., Hot Sulphur Springs, Colo.
 Rockie, Wm. A., 618 Realty Bldg., Spokane, Wash.
 Rowland, Ralph L., Box 153, Rochester, Vt.
 Rowland, Thomas E., Lolo National Forest, Missoula, Mont.
 Sargent, Philip A., Forest Service, Durango, Colo.
 Sawyer, Leslie E., Division of Forestry, Athens, Ga.
 Sebring, Harold M., Lenoir, N. C.
 Seidel, Wm. J., Dept. of Conservation and Development, Trenton, N. J.
 Siggins, Howard W., 305 Hilgard Hall, Berkeley, Calif.
 Smith, Harry F., 500 Dexter Ave., Montgomery, Ala.
 Smith, R. J., c/o Forest Service, Missoula, Mont.
 Somers, Gayle H., 115 W. Jackson St., Fostoria, Ohio.
 Space, Ralph S., Pleasant Valley, Mont.
 Spaulding, Dr. Perley, Northeastern Forest Experiment Station, Amherst, Mass.
 Spinney, George E., Bartlett, N. H.
 Springer, Jr., Willard, 1009 W. 4th St., Wilmington, Del.
 Squire, Horace H., Moretown, Vt.
 Stevenson, George E., Forest Service, Portland, Oregon.
 Stillinger, C. R., 618 Realty Bldg., Spokane, Wash.
 Stoner, Donald J., Forest Service, Glacier, Wash.
 Stover, Wm. S., 389 Junipero St., Pacific Grove, Calif.
 Strong, Clarence C., 618 Realty Bldg., Spokane, Wash.
 Swingler, Wm. Sherman, Coudersport, Pa.
 Taylor, Roy, 129 Mansfield St., New Haven, Conn.
 Thomson, Roy B., 5007 29th Ave., South, Minneapolis, Minn.
 Titus, Reginald T., Bloomingdale, N. Y.
 Tracy, C. H., Forest Service, Newport, Wash.
 Tyler, John N., 190 Main St., Deep River, Conn.
 Urquhart, James C., Kooskia, Ida.
 Van Giesen, Chester L., Forest Service, Gunnison, Colo.
 Vessey, Jr., James K., 109 Wayne St., Warren, Pa.
 Wakeley, Philip C., 323 Custom House, New Orleans, La.
 Weber, Arnold N., 2956 Claremont Ave., Berkeley, Calif.
 Wheaton, Rodgers G., Conservation and Development, 316 Jackson Bldg., Asheville, N. C.
 Williams, Roy L., Custer, S. D.
 Winslow, Callender F., 170 Broadway, Norwich, Conn.
 Winters, Robert K., Forest Service, Baker, Oregon.
 Wooschlager, T. P., Camp Mishike, Winchester, Wis.
 Worthington, Robert E., Quilcene, Wash.
 Wyckoff, Stephen N., 618 Realty Bldg., Spokane, Wash.
 Yochelson, Albert, 327½ E. Front St., Missoula, Mont.

SENIOR MEMBER

- Allen, E. T., Spalding Bldg., Portland, Oregon.
 Billingslea, J. H., Forest Service, Olympia, Wash.
 Brooks, A. B., 89 State St., Boston, Mass.
 Christie, H. R., 2575-35th Ave., W., Vancouver, B. C., Canada.
 Claridge, Bertram E., Hammermill Paper Co., Matane, P. Q., Canada.
 Douglas, Lynn H., 463 P. O. Bldg., Denver, Colo.
 Endersbee, W. J., 81 Grove St., Great Barrington, Mass.
 Hadley, Evan Worth, 323 Custom House, New Orleans, La.
 Harbeson, Thomas C., Milroy, Pa.
 Hine, Willard R., 323 Custom House, New Orleans, La.

Kephart, George S., 248 Center St., Bangor, Me.
 Kreutzer, Wm. R., Box 567, Forest Service, Fort Collins, Colo.
 Kroodsma, Raymond F., 643 Grove St., East Lansing, Mich.
 McLaren, John, 463 New Federal Bldg., Denver, Colo.
 Osborne, Jr., Wm. B., 405 Beck Bldg., Portland, Oregon.
 Plumb, H. L., Forest Service, Olympia, Wash.
 Riley, James E., 264 Fountain St., New Haven, Conn.
 Schreck, Robert G., Forest Service, East Tawas, Mich.
 Starker, Thurman J., Oregon Agricultural College, Corvallis, Oregon.

ASSOCIATE MEMBER

Fair, Paul J., Ferry Building, San Francisco, Calif.

CORRESPONDING MEMBER

Andrade, Edmundo Navarro de, Rio Claro, Sao Paulo, Brazil, S. A.

The following table shows the origin of the nominations published in the 1926 lists (May 1 and November 20), also in 1925, 1924, and the combined years 1922 and 1923:

Origin by Per Cent of Nominations

Nominators	1926 Per cent	1925* Per cent	1924** Per cent	1922-3** Per cent
Individuals.....	29.9	26.6	9.03	15.60
Sections:				
Northern Rocky Mountain.....	15.2	8.6	11.81	11.27
North Pacific.....	14.0	15.0	9.03	2.89
Central Rocky Mountain.....	10.4	3.4	11.81	6.64
California.....	9.2	13.1	5.56	15.60
New England.....	9.2	8.0	12.50	12.71
Minnesota.....	3.7	6.2	....	....
Allegheny.....	3.6	3.0	7.59	14.45
Southern Appalachian.....	2.4	....	....	....
Ohio Valley.....	1.2	5.0	2.78	....
New York.....	.6	3.4	6.94	6.64
Southwestern.....	.6	....	14.58	....
Intermountain.....	....	....	....	....
Washington.....	....	....	4.86	2.60
Wisconsin.....	....	6.4	....	3.75

*Figures taken from E. H. Frothingham's Report on Admissions for 1925.

**Figures taken from R. C. Bryant's Report on Admissions for 1924.

It is now the policy to refer all nominations by individuals to the Section concerned, if any, for its action. The attempt was made to do this for the list of May 1, 1926, and the practice was generally followed in the list of November 20, 1926. Objection has been made to the practice because of the delay which often results from the Sections deferring action until a regular Section meeting. The disadvantage

of such delay, however, is more than offset by the fairness and desirability of the policy of reference to the Sections for indorsement where Sections exist. It is, therefore, suggested that in the interest of time-saving the Sections authorize their executive committees to indorse nomination papers in every instance where to withhold action until a Section meeting would cause unnecessary delay. This is the practice followed by the Allegheny Section, and it has proved satisfactory.

The above table shows that some Sections have either thoroughly canvassed their nomination possibilities or are rather inactive in the matter. For example, the Intermountain Section has made no nominations for at least five years; the Washington (D. C.) Section, none for the past two years; and the Wisconsin Section, none for 1926. Nominations from the Southwestern and New York Sections during 1926 were less than one per cent each. In the interest of increasing our membership it is imperative that each Section should thoroughly canvass its nomination possibilities, including especially the graduating classes of the forest schools, and to present for election to the various grades every available and qualified candidate coming within its jurisdiction. It is distinctly the job of the Sections to take the initiative in this matter.

The forest schools are the most important source of increase for the Member grade. Their output of graduates who have found a position in forest work in say four months after graduation and are thus eligible for the junior membership is probably in excess of 100 annually. Yet the list of November 20, 1926, includes among the 63 candidates for Member only 13 who graduated from the forest schools last June—four each from California and Yale, two from Minnesota, and one each from Cornell, Penn State and Syracuse. What of the remaining eligibles from these and other schools? The figures speak for themselves. The schools are urged to explain to new graduates the desirability of having their names proposed for the Member grade and to follow this up, wherever possible, to the extent of notifying the secretaries of Sections where prospective candidates might locate in their first forestry jobs.

The Executive Council is urging a bigger and better Society. The first plank of its platform is the "inclusion within the Society of all qualified foresters; maintenance of a high standard of Senior Membership; and promotion of Members to this grade as rapidly as their qualifications permit." In accomplishing this the cooperation of every Section and every member is necessary. It is especially up to the

Sections through their executive committees or special membership committees to take prompt action in the matter.

J. GIRVIN PETERS,

*Member of Executive Council in
Charge of Admissions.*

Progress Report on Survey of Industrial Forestry

Pursuant to the suggestion that data collected on the practice of forestry by commercial organizations be assembled by The American Forestry Association for the Society of American Foresters, I submit the following summary of progress to date. Reports have been received from the following Sections of the Society:

SOUTHWESTERN SECTION

Reports no private forestry in its territory, but calls attention to the management of lands by the Forest Service which are owned by Arizona and New Mexico. Adds that slow growth discourages private forestry practice in the region.

ALLEGHENY SECTION

Originals of questionnaires submitted cover 11 lumber and mining companies in West Virginia, Pennsylvania and New Jersey. Some of these are endorsed as semi-confidential. Work so far reported covers 323,000 acres and eight foresters are employed.

SOUTHERN SECTION

Report from this Section is more nearly complete than any received, and includes data on 32 companies holding nearly three and one-half million acres and employing 16 full time foresters. Considerable use is also made by many outfits of the services of consulting foresters who work out plans for actual marking and reforestation work which is executed by men of the woods-foreman type. It is interesting to note that three companies which have employed foresters in former years have dispensed with their services at the present time.

MINNESOTA SECTION

Committee has been appointed and at last report expected to have some data to submit by the last of December, 1926.

WISCONSIN SECTION

Word from the committee under date of December 16, 1926, indi-

cates that an insufficient number of returns have come in from the questionnaire survey to make a full report. Progress to date, however, covers 508,660 acres controlled by lumber companies and 257,000 acres controlled by pulp and paper companies, in all a total of 24 companies controlling 765,660 acres. No data received on the number of foresters employed. Statement is made that no forestry is practiced by the railroads, although one company owns 110,000 acres. Study is being made of farm woodlot forestry and the reforestation and management activities on the Isaak Walton League areas.

NORTHERN PACIFIC SECTION

A number of reports are on file showing in some detail the activities of individual companies. In two instances quite extensive nurseries are maintained to serve areas in the Douglas fir belt. Several companies have, within the past two years, examined their properties with a view to determining the feasibility of forest management. It is expected that, during 1927, a very complete inventory of forestry activities by private owners will be available, and that distinct progress, as compared with a few years ago, will be shown.

CALIFORNIA SECTION

Complete reports submitted on nine companies with an area of 616,868 acres and employing 16 foresters.

SOUTHERN APPALACHIAN SECTION

Request was received early in the year for a supply of questionnaires which it was thought by this Section should be furnished by the Society. No report on results of survey yet received.

CENTRAL ROCKY MOUNTAIN SECTION

Joint report by the Central Rocky Mountain Section and the Forest Service. One company controlling total of 264,940 acres employing no foresters.

INTERMOUNTAIN SECTION

No practice of forestry reported. One company with 295,566 acres considering it.

Reports are lacking from the following Sections: Washington, Ohio Valley (two owners, 850 acres), New York and New England. A large amount of data has been supplied by the Forest Service

in a form which does not hook up with the questionnaire plan originally adopted by the Society. This information will be very useful, however, in filling in the blanks when the report is finally made up.

To expedite the work from now on it seems to me that the Society could well afford to have a supply of multigraphed questionnaires made up if the form can be agreed upon. I lean strongly toward the form originally suggested with a few modifications. The Allegheny Section has seen fit to use a questionnaire which does not seem to yield area in acres, which to my notion is a very important point. I think this comes from the way the question is stated, namely "State the region, territory or area covered by this report," and in many instances this has been interpreted to mean states or counties rather than acreage. Another point which might be covered by a caption numbered eight at the end of the attached questionnaire would give an opportunity to report remuneration paid the foresters employed and items which have been overlooked in the general questionnaire. After all, the questionnaire method, however, is useful only in the hands of one who aims at the exact kind of information that we want and would be very differently interpreted by a lumberman without a forestry viewpoint than by a forester.

I attach copies of both the original questionnaire form and the one with my extra suggestion,¹ and urge that if it is decided to furnish this to the Sections it be so made up that the information can be written into a questionnaire form and that there will be enough available so that the reporting individual may have duplicates for his file.

SHIRLEY W. ALLEN.

REPORTS FROM SECTIONS

New York Section

1. *State Forest Policy*

The Section's Committee on State Forest Policy, Professor Ralph S. Hosmer, Chairman, presented detailed recommendations from the Section to the State's Government Reorganization Committee recommending the establishment of a non-political, non-partisan advisory board to supervise policies and activities of the State Conservation Commission.

¹ These will be considered by the Executive Council and taken up with the Sections in connection with the continuation of the present study.

2. *Statistics and Standards*

The Section accepted the report of its Committee on Statistics and Standards as outlined below in the belief that it would be desirable for all the foresters in the state to use uniform statistics in their contacts with the general public in order that a united front might be presented by the profession on all forest matters, especially those relating to public education on forest policy:

1. That it compile and collate statistics relating to the growth, yield, etc., of New York forests and forest conditions.

2. That it endorse and promulgate for general use such collected material as it believes to be most nearly correct.

3. That it approve such technical methods and plans to be used in forest investigative work as may be submitted to it by the members of the Section which will, in its opinion, result in accurate and dependable information.

4. That it on request furnish the executive committee with facts which will assist in determining what matters of forest policy should be advocated by the Section and with which it can prove the necessity for their adoption.

5. That it submit to the Section as a whole at the winter meeting a digest of the things approved during the year.

6. That when approval of material or method has been withheld by the committee such disapproved material or method shall be submitted to the Section in detail for discussion and proper action if desirable in the opinion of the committee or if requested by member submitting such material.

3. *Executive Committee*

The Section's By-Laws were changed "to provide for an Executive Committee consisting of six members, namely the Chairman, the retiring Chairman, the Secretary and three others, each of whom shall be chosen at the annual meeting of the Section, and (with the exception of the retiring Chairman, who shall serve on the Committee for a period of three years) shall serve for two years or until their successors are elected and qualified. This Executive Committee is responsible for the development of the Section and its work between annual meetings. It proposes policies and procedure for action by the Section."

4. *Program*

At its January, 1925, meeting the Section appointed a Committee on Program, with the following specific duties:

- (a) To prepare programs for the winter and summer meet-

ings of the Section in complete detail, obtaining the necessary papers, having advance copies duplicated for distribution prior to the meeting and arranging all details of the program.

- (b) Preparing recommendations at least annually for action by the Section as to its program of work, with the thought that there should be continuity of consideration by the Section of general constructive forestry problems.

The Section has accepted the Committee's program policy report, as follows:

- (a) Summer meetings to be held in different parts of New York State in order to observe the actual practice of forestry.
- (b) Winter meetings to continue discussion of the theory of forest practice as observed at summer meetings; to cover current matters of interest to the foresters of New York State and to the development of the Society; and to review subjects previously discussed where necessary in order to thoroughly cover the field of forest theory and practice in so far as possible.

It is felt that a Program Committee is essential in developing interesting, constructive meetings but that its field is clearly confined to the preparation of satisfactory programs for the Section's summer and winter meetings and that it must not usurp the functions of the Section's Executive Committee whose duty is to outline policies for the Section and to be responsible for any necessary action by the Section during the interim between meetings.

5. *Survey of Practice of Forestry by Private Owners*

The Section, in cooperation with the New England Section, has prepared a form for reports by its members on the practice of forestry in New York State in accord with the request of President Dana. It is expected that a report in this matter will be presented on behalf of the New York Section at the Society's meeting in Philadelphia on December 29th and 30th.

O. M. PORTER, *Chairman.*

Allegheny Section

The Section held two meetings during 1926. A winter meeting was held at Harrisburg, Pa., March 5 and 6, and a summer meeting in West Virginia, July 21, 22, 23 and 24. A detailed itinerary of

the summer meeting is enclosed, together with a list of those attending each of the meetings. Through the efforts of the members within West Virginia a number of prominent lumbermen and others interested in and identified with forestry practice, but not members of the Society, participated in our summer meeting.

Minutes of each of the business sessions are transmitted herewith, for your information and for such use as you may desire to make of them. Please refer to a letter from the undersigned to President Dana dated August 5, copy enclosed, concerning action of interest to the Executive Council taken at our last meeting.

During the year the members of the Section have aggressively supported early establishment of the Northern Appalachian Forest Experiment Station, and the passage of the McNary-Woodruff bill. Efforts also have been made to increase membership in the Society and the Section by canvassing all known eligibles within the territorial limits of the Section.

The Committee on Forest Information has completed its report on the investigative projects now under way within the Allegheny Section. That report of about 70 pages covers the extensive activities of the committee during the past two years, and a copy of it will be sent to each member of the Section and to those individuals and agencies outside the Section to whom it will be of interest.

The chairman of the Committee on Forest Information has sent to Mr. Shirley Allen data obtained by it concerning the survey of forest practice on private lands.

The annual meeting of the Allegheny Section, of the Society of American Foresters, was held in Philadelphia, Pa., December 30, 1926, in conjunction with the annual meeting of the Society. A total of 48 members of the Allegheny Section were present at one or more of the sessions of the Society meeting. The business meeting was held at the Hotel Pennsylvania on Thursday noon following a lunch in the main dining room at which over 40 attended. Only routine business was undertaken as the members present all desired to participate in the discussions of the Society. The summer trip of the Section will be held sometime between July 15th and 30th and will cover the forestry operations in the anthracite coal regions of Pennsylvania.

The Section elected the following officers for 1927: F. W. Besley, chairman; J. H. Preston, vice-chairman; H. F. Round, secretary-treasurer.

H. R. CONDON, *Secretary-Treasurer.*

Wisconsin Section

A complete report on the Survey of Private Forestry in Wisconsin and Upper Michigan is hardly practical yet on account of the number of returns which have not yet come in. The new officers contemplate a follow-up. We have, however, received reasonably good returns to date. The suggested questionnaire with some small modifications was used.

The outstanding event of the year for this Section was the meeting of the National Society here last December. We have held eight meetings, four of which were of the seminar type open to non-members and at which subjects of broad interest were discussed before three or four times the usual attendance. At the last meeting the following officers were elected for the coming year:

Chairman—C. V. Sweet, Forest Products Laboratory.

Secretary—F. G. Wilson, Ag.-Eng. Bldg., University of Wisconsin.

The writer's duties as secretary end with the preparation of the enclosed summary.

E. M. DAVIS, *Past Secretary.*

Minnesota Section

Nine meetings have been held during the past season, five open meetings and four business meetings. The attendance varied widely but except for the open meeting when the drying up of lakes was the subject, it was discouragingly small. Apparently it requires a subject of unusual popular interest to draw a crowd.

The Section now has 18 Senior Members, 17 Members and four members of the Section, who are not Society members. One of the latter group was elected during the year and final favorable action was received on two Senior Members and four Members.

In response to the suggestion of the Society the Section raised and contributed \$30 to the fund for the current expenses of the National Society.

Three matters which came up during the year have not been brought to completion. They include, first the proposed change in name and scope of the Section from Minnesota to Upper Mississippi Valley; second, the report of the committee appointed to draft a forest tax law for Minnesota; and third, the organization of the project undertaken by the Society to make a survey of the status and progress of private forestry, in which this Section was responsible for its own territory.

of growth; Dr. Carl Schenck on a subject to be chosen; and probably one or two other speakers.

W. M. NAGEL, *Retiring Secretary.*

California Section

The officers for the season of 1925-1926 were: T. D. Woodbury, U. S. Forest Service, Chairman; Emanuel Fritz, University of California, Secretary. Eight meetings were held as follows:

September 14, 1925—Hilgard Hall, Berkeley. Business meeting. Section and parent society matters received attention.

October 6, 1925—Ferry Bldg., San Francisco. Special meeting. State Forestry. Occasion of visit of Association of State Foresters.

November 13, 1925—Hilgard Hall, Berkeley. "Problems of Forestry Education."

December 17, 1925—Ferry Bldg., San Francisco. "Fire Protection Devices and Methods."

January 15, 1926—Ferry Bldg., San Francisco. "Blister Rust Control."

February 11, 1926—Ferry Bldg., San Francisco. "The Relation Between Recreation and Forestry."

March 19, 1926—Hilgard Hall, Berkeley. "The White Fir Problem."

April 20, 1926—Hilgard Hall, Berkeley. Business meeting and talk by Mr. G. M. Cornwall on his Southern trip.

The meetings in general were well attended and productive of progress in the understanding of Society matters and enlightenment on the subjects up for discussion. As was the custom in previous years, the time devoted to "business" was held at a minimum thus giving the bulk of the evening to the programmed topics. Business was conducted at two meetings called solely for that purpose. Meetings held in San Francisco were preceded by an informal dinner at a local restaurant. Another custom that was continued was the appointment by the Section chairman of a special chairman to conduct the discussion on the topics on the program. Men outside the Society who were known to be especially interested in the topics were invited, thus adding a great deal to the success of the discussions. Guests at program meetings included representatives from the lumber industry, the grazing industry, the recreational field, the forestry club of the University of California, and others. Following each meeting the proceedings were mimeographed and sent to each member.

These mimeographed proceedings entailed considerable time and expense but were considered very valuable, especially to those members who reside too far from the San Francisco Bay region to attend meetings. Announcements of coming meetings were sent out in mimeographed form also, thus giving greater space for acquainting the members of the business and topics to be discussed.

The California Section now has—

45 Senior Members
63 Members
9 Associate Members
9 Section associates

126 Total

Fifty-five of these are residents of the San Francisco Bay region.

The table following indicates the varied pursuits or occupations of the membership:

59—U. S. Forest Service.

5—Other Government Bureaus.

3—State and County Forestry Departments.

13—University of California, faculty and graduate students.

11—Foresters in private employ as foresters.

19—Lumbering.

2—Lumber Association Secretaries.

14—Miscellaneous fields, including ranching, lumber trade, journalism, railroads, public office, retired men, etc.

Through its active membership committee the California field has been very thoroughly gone over for men eligible to membership. The chairman of this committee, Mr. C. E. Dunston, keeps a card index record of all eligibles from which can be learned whether an eligible has been proposed for or elected to membership, or whether the invitation to join has been declined.

Dues for the year were again set at \$1 for members resident in the San Francisco Bay region, and 50 cents for those living in other sections of the state and too far away to attend Section meetings. The secretary takes pleasure in recording the interest of local and out-of-town members in the California Section, nearly 90 per cent of the Section's members having paid local dues the past year. The expenditures equalled the receipts and were almost solely for mimeographing and postage.

Officers for the season 1926-1927 are: C. L. Hill, Forest Service, Chairman; Emanuel Fritz, University of California, Secretary.

Special projects of the Section included interesting Associate Members in subscribing to the Journal of Forestry and of endeavoring to obtain advertisements for the Journal. Six subscriptions were obtained but no advertisements. A start was also made in a study of the extent to which private owners of timberlands in California practice forestry. This study is a part of the national study conducted by the parent Society.

EMANUEL FRITZ, *Secretary*.

Report of New England Section, 1926

The by-laws of the New England Section provide for but two meetings a year, one during the winter and one during the summer. The latter is almost always in the form of a field trip and two or three days are given over to it.

Our winter meeting was held in Boston last January and aside from matters of routine business, the principal topics of discussion were the effects of the grazing industry on forest management and personnel problems in the Forest Service. Mr. P. L. Buttrick, Secretary of the Connecticut Forestry Association, gave us the results of his very thorough study of the grazing industry and its effects on forest management especially in European countries and brought out the striking fact that through the centuries, grazing has been a more destructive element in the forest than lumbering. Mr. Buttrick's studies were afterwards published in *American Forest Life*. As a result of this discussion a strong resolution condemning the Stanfield bill was adopted and sent to all New England representatives in Congress.

Mr. Roy Headley, on behalf of the Forest Service, explained the growing complexities in the administration of the National Forests and the resulting higher type of men needed even in ranger positions.

Our summer meeting was held on the Battell Forest of Middlebury College, Vt., which is under the able administration of J. J. Fritz. At this summer meeting we visited cutting operations on the forest, a number of hardwood using industries in the vicinity and the nursery of the Vermont Forestry Dept. at Essex Junction. Some of the members also visited the conspicuous example of serious blister rust infection at Waterford. There were two business sessions and a social evening. The last for the benefit of the twelve wives of members who were present.

The New England Section has 125 members and probably takes in 75 per cent of the men in these states who are eligible to belong. Attendance at meetings averages between 50 and 60. Prof. K. W. Woodward of N. H. University is Chairman and H. O. Cook of the Mass. Conservation Dept. is Secretary.

H. O. COOK, *Secretary.*

Report of the Editorial Board

The Editorial Board reports to the Society eight times a year in the form of the issues of the Journal. It has, therefore, very little to report at the time of the annual meeting. The statistics of subscriptions, costs, geographic distribution of readers, and similar matters are usually covered by either the Secretary or the Treasurer.

The Board confines itself, therefore, merely to a recital of the facts which are obvious and indulges in a few suggestions.

WHAT HAS BEEN DONE DURING THE YEAR

1. The outside garment and the physical makeup of the Journal has been changed. Judging from the comments of member-readers, this change was pretty generally accepted as an improvement over the old style. Several readers expressed regret that the size of the page of the Journal was changed in the middle of the volume which they thought would make binding inconvenient. It is of course impossible to suit the color tastes of every member, and the Board must assume the criticism of the color if it is not in good taste. As to the change in the size of the page, there is evidently an error on the part of the critics. The margin of the pages of the unbound issues has been increased, but the printed page itself remains exactly the same. Therefore, no difficulty should be experienced in binding the issues of last year into a uniform volume.

2. The number of copies per issue has been increased from 1,900 to 2,000. All these are distributed with only a very few copies left to spare. Several issues during the year probably have no extra copies left for distribution. This is unfortunate as it breaks up complete sets of the Journal for prospective members, libraries, or other purchasers of the old volumes.

Printing a large number of copies per issue, however, is in the nature of an investment which the Board, with its limited current allotment, could not afford.

3. The present cost of printing is about the lowest that the Board can secure and yet produce the printed copy consistent with the standards and the taste of the membership of the Society.

Correspondence with other printers during the year, including Science Press, showed that other printers could not lower our present costs. The additional benefits of close contact with the present printer, and many intangible considerations that come from such close co-operation between the editor and the printer made any change undesirable.

4. The number of advertisements has very slightly increased. This is a progress for which the Board cannot claim credit. As a matter of fact, the efforts of the editor in this direction were crowned with very meager success. Whatever new advertisements came in, did so on their own accord due to the increased influence of the Journal.

5. A larger number of serious articles by foresters from foreign countries have been published this year with the prospect that this kind of contribution will still further increase. It is a debatable question whether we should be generous with space in the Journal to foreign contributors or limit it more to our own authors. On one hand it is an indication of the growing influence of the Journal abroad, with a corresponding increase in the prestige of the Society throughout the world. On the other hand, it still further limits already limited space to our own foresters.

6. The quality of the papers published has slightly increased. The policy was to eliminate papers dealing with detached facts, observations, or measurements, and publish in the form of articles, only material of a comprehensive character and of wider application. Some of the smaller articles were actually rewritten and published in the form of notes.

7. The Journal still continued, reluctantly, and at considerable expense, the current literature prepared by the Forest Service. Correspondence with quite a large number of readers of the Journal, but not by any means exhaustive, revealed that the current literature is used mostly by forest school men and a few members of experiment station staffs, in all probability not over 10 per cent of the readers of the Journal. A suggestion to the editor of the *Forest Worker* which is soon to come out in printed form to take over the printing of the current literature, brought back the reply that the *Forest Worker* could not afford to print it both because of the space and the cost. What to do with the current literature is, therefore, a problem. It is not a contribution to bibliography, though it can be used as a casual source for making up bibliographies on subjects in which one may be interested. With the Biological Abstracts now well organized, the advisa-

bility of printing the current literature in view of its limited benefit to a small percentage of our readers deserves earnest consideration.

If the current literature is to be continued to be printed in the Journal we may want to modify its form and eliminate some of the references to articles appearing in obscure trade papers limited to special forest products or references to the articles appearing in the Journal of Forestry, and a few other items.

8. The cost of reprints to contributors is apparently satisfactory as no complaints were received this year as to the exorbitant prices charged for reprints, yet the number of reprints themselves has considerably increased.

9. The assistance given by the members of the Editorial Board has greatly increased. More of the manuscripts are not merely approved or disapproved by the editors of their respective fields, but more manuscripts have been actually edited and prepared for the printer.

10. More leading articles and discussions of vital topics appeared in this year's Journal than before.

11. The reporting of the activities of the Sections is still far from complete. The Journal still weakly reflects the doings of the profession as a whole. Many important events pass unnoticed and uncommented upon by the Journal.

12. The official organ of the Society continued to be a professional Journal of Forestry devoted to all branches of forestry and not merely proceedings of the Society as some suggested it to be. In the opinion of the Board it would be a step backward to make the official organ a mere proceedings, although it realizes the need for representing more fully the doings of the Society itself and never refused any space to discussions of this character. It would be a mistake, however, to make the doings of the Society the dominant feature of an organ.

We have close to 1,000 subscribers who are not members of the Society here and especially abroad who take the Journal because they are interested in the technical development of forestry in the United States and not because of their interest in whether the Society should elect its members for one or two years, or whether the name of the Society should have the "The" or not.

RECOMMENDATIONS FOR ENSUING YEAR

1. An allotment of \$7,600 for the Journal instead of the present \$6,300 as provided in the budget. This is, of course, on the condition that the increased dues upon which a vote has been taken, goes through.

2. An increase in the number of issues per year from 8 to 12 is not essential. There are both advantages and disadvantages in making the Journal a monthly publication. The advantages are:

1. Being a regular monthly publication it can react more regularly and frequently toward the current events and developments in forestry.

2. It will provide a more sustained interest in forestry every month.

3. It will enable the Journal to publish a larger number of articles of domestic and foreign origin.

4. It will make it more attractive as a medium for advertisers.

The disadvantages are:

1. It will more than proportionately increase the cost of individual numbers: more envelopes and postage.

2. With a still meager supply of high grade papers, it may tend to lower the standard of the papers published.

3. The benefits from publication during the summer months when most of the foresters are in the field are of doubtful benefit.

4. It will impose a greater burden on the members of the Editorial Board who, also being in the field, can not as conveniently attend to the issuance of the Journal in summer as they can during the rest of the year.

5. The larger allotment if it materializes, can be used for increasing and improving the present eight issues of the Journal.

6. Even with an allotment of \$7,600 each individual number on a 12-month basis must be smaller than the present numbers on an eight-issue basis. Yet the number of envelopes and cost of handling and other expenses will be the same.

For these reasons it seems to the Board that the main consideration is not so much the number of issues per year as the quality of each number issued.

3. The subscription price of \$6 even on a monthly basis, as proposed by the Executive Council, seems too high. The Board prefers a subscription price of \$5 which can be applied to the present eight issues if the allotment to the Journal is increased to \$7,600 and the quality of the material published improves. A subscription price of \$6 is not warranted by the present printing costs. It would seem an attempt to make the subscribers who are not members of the Society pay in part for the Journal to the members of the Society.

4. The Board does not see any need for a change of policy regarding the class of articles to be published in the Journal.

5. The Section activities of the Society should be more fully reported. This should be one of the principal activities of the Executive Secretary of the Society. Pending the appointment of such a secretary, the chairman of the Committee on Sections should be in close contact with the doings of the Sections and provide material for the Journal. If for some reason this is impractical, some member of the Executive Council or the Editorial Board should be made responsible for the collecting of such material. During the last year the Editor had considerable difficulty in getting even the right names and addresses of the chairmen and secretaries of the Sections for publishing in the Journal. This is the best means of welding the Sections into a strong national Society.

6. After several attempts to increase the advertising of the Journal, the Editor is of the opinion that the only practical way to do it is through the Sections. The secretary of each Section should be made responsible for securing both advertisements and new subscribers within its geographic limit.

During the past year the secretary of the California Section secured a number of new subscriptions. What one secretary can do, certainly others can likewise do.

The Editorial Board,

EMANUEL FRITZ,
B. P. KIRKLAND,
ALDO LEOPOLD,
T. S. WOOLSEY, JR.,
A. B. RECKNAGEL,
R. A. FERGUSON,
C. G. BATES,
FRANKLIN MOON,
RAPHAEL ZON.

Committee on Standardization of Forest Fire Practice

This committee has been cooperating with the United States Forest Service and the Association of State Foresters in laying the ground work for standardized forest fire practices, so far as that is practicable. It was concluded after conferences in 1925 that a number of investigations are necessary before recommendations can be made and the

United States Forest Service agreed to undertake these investigations in cooperation with the States.

The committee is informed that the Forest Service is now carrying on investigations in fire damage, forest fire weather, inflammability of fuels and a statistical study of fire records. Under the direction of the office of Forest Experiment Stations during the year, the Forest Service published a bulletin bearing upon this subject by Gisborne—"Lightning and Forest Fires in the Northern Rocky Mountain Region."

R. Y. STUART, *Chairman*,
P. T. COOLIDGE,
H. E. FLINT,
R. C. HAWLEY,
S. B. SHOW,
E. O. SIECKE,
C. P. WILBER.

Grazing Legislation

The Executive Council of the Society of American Foresters at its annual meeting in Philadelphia on December 27 considered the letter from Col. W. B. Greeley to President S. T. Dana of the Society concerning the present grazing situation on National Forests and public lands. The tendency of proposed legislation was discussed with particular reference to the Stanfield and Haugan bills. After considering these from every conceivable point of view, the Council decided that it will stand firm on its previously established opinion, which places it in opposition to any Federal legislation which will take away or impair the present authority of the Secretary of Agriculture to regulate grazing.

It further believes that the membership of the Society of American Foresters should be more thoroughly appraised of the situation, and placed in a better position to voice an intelligent opinion. To this end the Editor of the Journal will be asked to devote the February issue to a discussion of grazing from all sides. The Council urges that this discussion be allowed to continue through as many subsequent issues as the interest warrants. Before the close of the year 1927 a ballot of the entire membership of the Society on the subject of grazing legislation should be called for.

During the meeting of the Society of American Foresters on December 29, the report of the Committee on Grazing Legislation signed by H. H. Chapman and Henry Schmitz, and also the secondary report by A. W. Sampson, were read. President Dana explained the position

of the Council in making its recommendations, and Col. Greeley spoke on the relation which grazing bears to the administration of the National Forests. He expressed the opinion that the lack of such legislation is a distinct gap in the Roosevelt conservation policy. He expressed a desire for legislation, but agreed with the Council that it should in no way tie the hands of the Secretary of Agriculture.

Col. Greeley does not think that the present Stanfield bill limits action by the Secretary, but is opposed to the so-called Norris bill because he feels it goes too far in writing detailed phases of grazing into the administrative law.

The meeting passed a motion supporting the action of the Council and giving it power to act for the Society in case of necessity.

National Program of Forest Research

Mr. Earle H. Clapp,

U. S. Forest Service, Washington, D. C.

Dear Mr. Clapp:

During the recent meeting of the Society of American Foresters and of the Executive Council at Philadelphia, the recently published report, entitled "A National Program of Forest Research," was considered, and most favorably commented upon. The following resolutions were passed by the Council, and by the Society at its large meeting attended by about 130 members:

"The Executive Council of the Society of American Foresters endorses the program as set forth in the National Program of Forest Research, published as the report of a special committee on forest research of the Washington Section of the Society of American Foresters by the American Tree Association, and urges the passage of legislation adequate for carrying this into effect.—Philadelphia, Pa., December 27, 1926."

"The Society of American Foresters at its annual meeting in Philadelphia, Pa., December 29 and 30, 1926, supports its Executive Council in endorsing the program set forth in the National Program of Forest Research.

"Furthermore, the meeting expresses its appreciation and admiration of Mr. Earle H. Clapp for his efforts in getting out this program.—Philadelphia, Pa., December 29, 1926."

Copies of this are being sent to President Stuart, former President Dana, and Mr. Zon of the Journal of Forestry.

Very truly yours,

G. H. COLLINGWOOD, *Secretary*.

A Correction

The Secretary's report of the twenty-sixth annual meeting of the Society as published in the January, 1927, issue of the JOURNAL OF FORESTRY contains the following statement:

"In this relation two motions of outstanding significance were passed: * * *

"(2) That the Treasurer include a slip with each bill for 1927 dues, stating that all those who voted for an increase in dues might show their good faith and loyalty to the Society by enclosing a check for \$8 or \$12, depending upon whether they are a Member or Senior Member. This would be in place of the established dues of \$4 and \$5."

The facts, in brief, are as follows: Professor Woodward moved that the Treasurer include a slip with bills for 1927 dues, calling attention to the Society's need for funds and suggesting that instead of regular dues Members and Senior Members contribute respectively \$8 and \$12, the amounts proposed in the constitutional amendment which had just been disapproved. This motion was amended to suggest instead of \$8 and \$12 that voluntary contributions be \$6 and \$8, the amounts suggested by the Executive Council for consideration in a proposed new ballot. The amendment was adopted, but the motion as amended was lost. The vote on the motion as amended was fairly close, and a division was called for which confirmed the original ruling of the chairman that the motion had been lost. A parliamentary question was raised by one of the members as to whether an amendment to a motion remained effective after the motion to which it was attached was lost; the chairman replied that it did not.

The final result of the discussion was, therefore, that the annual meeting made no suggestion in regard to any request for voluntary contributions.

G. H. COLLINGWOOD.

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